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ABSTRACT

Focusing on books that use the sea as their theme, this booklet provides guidelines for teachers on how to integrate marine-related children's literature into the classroom. The first section of the booklet presents brief synopses of eight sea-related books while the second section contains 39 learning center activities, including knot tying, model building, soap carving, weaving, wood construction, and wood painting. Each activity is related to a specific grade level and book and includes a list of required materials, preparatory suggestions for the teacher, and instructions for the students. Appendixes contain worksheets and illustrations for use with the activities, lists of sources for free and low cost materials, and a bibliography of marine-related books. (FL)

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Children's Literature — Passage to the Sea

A Guide for Teachers

by
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Norma Bagnall

Ruth González developed the following activities: Blah, Fun Folders, Locate It, Match-Up Card Game, Seashell Computer, Sea Vessel Match-Up, Shark or Sea Creatures Game, Shell Wheels, Ship's Cross-Section, Stained Glass Rainbow, Stuffed Sea Animals.

Preface

Although the United States developed as a sea nation, American education has concentrated primarily on the land. It has not stressed the importance of our marine resources, either for today, or, perhaps more importantly, for the future. The fact is, however, that our standard of living depends on the quality and supply of fresh water and on the carefully planned use of the sea and its resources.

It is important that children learn an appreciation for our marine resources early. Ideally, first-hand experiences might be more beneficial, but inland children cannot be denied the opportunity of learning of the beauty, mysteries and importance of the sea.

Fortunately, there is an available alternative — excellent literature written and illustrated by people who not only know and love the sea but who are capable of transferring that love to the written page to share with others. This booklet introduces some of this literature and provides a guideline for teachers on how to integrate marine-related children's literature into the classroom.

Table of Contents

Introduction 1
Book Synopses 2
- Spill, by Chester Aaron 2
- The Craft of Sail, by Jan Adkins 2
- The Eyes of the Amaryllis, by Natalie Babbitt 3
- Island of the Blue Dolphins, by Scott O'Dell 3
- Noah's Ark, by Peter Spier 3
- The Cay, by Theodore Taylor 4
- Christopher Columbus, by Piero Ventura 4
- Seashore Story, by Taro Yashima 4

Interest Center Activities 5
- Beneath the Mast 6
- Blah 7
- Browsing Table 7
- Concentration 8
- Discovering Latitude and Longitude 8
- Elementary Physics and Engineering 9
- Fish Mobiles 9
- Flag Bingo 10
- Flannelboard Ark 10
- Flotation Experiments 11
- Food Chain Game 11
- Fun Folders 12
- Hurricane 12
- Hurricane Tracking 13
- International Flag Alphabet 13
- Knot Tying 14
- Listening Center 14
- Locate It 14
- Match-Up Card Game 15
- Model Island or Beach 15
- Net Making 16
- Refrigerator Carton Ship 16
- Sand Painting 16
- Seashell Computer 17
- Seashell Identification 17
- Sea Vesssel Match-Up 18
- Shark or Sea Creature Game 18
- Shell Wheels 19
- Ship's Cross-Section 19
- Slide Center 19

Soap Carving 20
Stained Glass Pictures 20
Stained Glass Rainbow 20
Stuffed Sea Animals 21
Survival Skills 21
Transparent Film Art 21
Weaving 22
Wood Construction 22
Wood Painting 22
Appendix 23
Questionnaires 24
Illustrations 28
Free Materials 46
Low-Cost Materials 48
Bibliography 49

Introduction

The marine awareness learning package is centered around books which use the sea as their themes. Brief synopses of eight books are included as well as descriptions of how they can relate to learning center activities.

A major feature of the learning package is the interest centers set up in the classroom. These include activities such as shell identification, knot tying, net making, marine flag identification, latitude and longitude study, creative art and survival skills. Students select the activities in which they want to participate as they explore the process of marine education.

Neither the listing of books nor the learning activities is meant to be comprehensive. This marine awareness learning package should be considered a starting point for a program that can be expanded and adapted to each individual classroom need. Completion of the suggested activities should foster additional activities as teacher and students pursue marine education further. One obvious expansion will occur when a teacher has a favorite sea story to read to the class; teachers will find many of the learning activities included in this package suitable for those favorite books.

Regardless of the grade level, it is best to read the selected book before arranging the interest centers. As the students listen to the story, they will be motivated to try to duplicate the characters' activities or to test the principles or theories expressed by the authors.

For example, the blinded protagonist in **The Cay** encourages young readers to experiment with some of the tasks undertaken by Phillip in the story. Also, because of the careful description of the cay's location in the story, it seems natural to bring an atlas or globe into the classroom and ask questions which lead students to learn about latitude and longitude.

Similarly, **The Craft of Sail** generally makes young readers want to test the engineering principles presented, to try tying the knots illustrated and to sail a ship, even if the ship is made of soap and sailed in a plastic dishpan.

The interest centers are extensions of the books and designed to enhance the students' ideas of the oceans and beaches. Teachers must decide what kind and how many interest centers will be set up. Space limitations will be a determining factor, as will the ages and capabilities of the students. It is one way, however, that most of the room can be used; floor space in a corner becomes an excellent place to set up a slide show display with a piece of paper taped to the wall for a screen.

Not all teachers will be comfortable with interest centers throughout the classroom. An alternative arrangement is to set up only two or three centers, self-contained as in any interest center, as a place where students can go for independent work once regular classroom assignments are completed.

There are some general interest center guidelines for teachers:

1. Decide what you want your students to experience and learn.
2. Decide what you want your students to be able to do as a result of participating in each interest center.
3. Make each center attractive, appealing and inviting.
4. As a general rule, have all materials and supplies needed for each activity available within that interest center. This can be adapted to particular situations; some teachers prefer to keep scissors, pencils, markers, etc., in a central location, or the overhead projector or film strip projector may need to remain in one place.
5. Make instructions clear and simple. Students, even the poorest readers, should be able to work independently with very little help from the teacher.
6. Plan a way to review with the students so the material learned may be shared with the whole class.
7. Allow the students time to explore all the interest centers before deciding which activity they will pursue. Once that decision is made, however, encourage them to remain in the center until they have completed the activity.

This marine awareness learning package is divided into four sections: Books, activities, illustrations and questionnaires and sources of additional materials. Each activity is related to a specific grade level and book, includes a list of required materials and has preparatory suggestions for the teacher and instructions for the students.

The illustrations and questionnaires are designed for easy duplication for transparencies or for ditto or stencil masters. This allows the teacher to provide sufficient copies for use in the interest centers.

Book Synopses

The eight books included have been used with the interest center activities which follow. These eight were selected because they represent a variety of reading ages and interests.

The settings vary in time from the Flood more than 4,000 years ago to a contemporary oil spill in the 1970's. Locations include the Atlantic, the Pacific, the Gulf of Mexico, South American and Japanese coasts and the shipping lanes from Europe to America.

These books are representative of many genres written for children; there are information books, fantasy, history and legends. The activities designed for use with these books should be readily adaptable to others similar in kind by individual teachers.

Spill

Chester Aaron

Teenagers Judy and Jeff Taylor and their parents live on a small ranch above Bolinas, California. Mrs. Taylor works for the Audubon Canyon Ranch, Mr. Taylor raises sheep and Judy cares for injured birds and animals. Jeff is going through a rebellious stage; he is arrogant and opposed to many of his family's values.

An oil spill off the coast caused by the collision of two oil tankers encompasses the Taylor family and their neighbors. They work around the clock to save birds injured by the oil and they build a boom to protect their lagoon from further oil seepage. The family incidents are overdrawn and the weakest part of the book; otherwise, it is a realistic telling of people concerned about the environment.

Specific activities that adapt well to this book are:
- Beneath the Mast (6)
- Blah (7)
- Food Chain Game (11)
- Listening Center (14)
- Model Island or Beach (15)
- Sand Painting (16)
- Seashell Computer (17)
- Seashell Identification (17)
- Shark-Sea Creature Game (18)
- Shell Wheels (19)
- Slide Center (19)

Ages 12 and up

Atheneum, A Margaret K. McElderry Book, New York, 1977

The Craft of Sail

Jan Adkins

Jan Adkins writes, illustrates and designs his books. He counts words, even letters, to make certain each page is aesthetically pleasing. He also has a deep love for the sea. The result of this care and interest is a rich experience for the reader.

This book, intended to be a beginning text for would-be sailors, includes engineering principles, nautical language, various kinds of sails and sailing ships, knot tying and charts. All directions are written and illustrated in a way even the youngest reader can understand. The book can be combined with other sea literature (the sailor's knots on pages 46-48 are excellent guides for children learning to tie their own knots) or it can be used as a resource for independent study. The introduction carefully defines how the sailboat is in harmony with the wind and water and that, because of this, the sailboat moves with the forces of nature rather than trying to overcome them.

Specific activities that adapt well to this book are:
- Beneath the Mast (6)
- Blah (7)
- Concentration (8)
- Discovering Latitude and Longitude (8)
- Elementary Physics and Engineering (9)
- Flag Bingo (10)
- Flotation Experiments (11)
- Hurricane Tracking (13)
- International Flag Alphabet (13)
- Knot Tying (14)
- Match-Up Card Game (15)
- Refrigerator Carton Ship (16)
- Sea Vessel Match-Up (18)
- Ship's Cross-Section (19)
- Soap Carving (20)
- Wood Construction (22)

Ages 8 and up

Walker and Co., New York, 1973

The Eyes of the Amaryllis

Natalie Babbitt

This is the story of two Jennys — Geneva Read and her grandmother. Jenny has been summoned to her grandmother's house because Gran has broken her ankle. Jenny lives with her parents 30 miles from the Atlantic coast where Gran lives but she has never been to the ocean.

The story, set in the 1880's, deals with the death of Jenny's grandfather 30 years before in a storm off the coast and with the fantasy which surrounds the sinking of the **Amaryllis**. It bridges a double generation gap when Jenny confesses she doesn't care much for cooking and Gran acknowledges she doesn't either. So they decide, "We shall do as little of it as we possibly can without starving" (page 25).

The prologue gives a marvelous glimpse of the Atlantic and of human behavior as Babbitt gives young Jenny her first view of the ocean, and the reader experiences its might and splendor through her eyes.

Specific activities that adapt well to this book are:
Hurricane (12)
Hurricane Tracking (13)
Listening Center (14)
Net Making (15)
Sand Painting (16)
Seashell Computer (17)
Seashell Identification (17)
Sea Vessel Match-Up (18)
Shell Wheels (19)
Slide Center (19)
Soap Carving (20)
Stuffed Sea Animals (21)
Transparent Film Art (21)
Wood Painting (22)

Ages 11 and up
Farrar, Straus and Giroux, New York, 1977

Island of the Blue Dolphins

Scott O'Dell

This story is based on the true account of an Indian girl isolated on an island off the coast of California for 18 years. Karana jumped off the ship when missionaries left with her people because her brother, Ramo, was not aboard. She knew he was somewhere alone on the island — so the ship sailed without her.

The book chronicles her growth and survival, alone, on the island. It tells of her need for companionship, for beauty and, at the end, for acceptance.

Specific activities that adapt well to this book are:
Discovering Latitude and Longitude (8)
Fun Folders (12)
Knot Tying (14)
Listening Center (14)
Model Island or Beach (15)
Net Making (16)
Sea Vessel Match-Up (18)
Soap Carving (20)
Stained Glass Pictures (20)
Stuffed Sea Animals (21)
Survival Skills (21)
Transparent Film Art (21)
Weaving (22)

Ages 10 and up
Houghton, Mifflin Co., Boston, 1960

Noah's Ark

Peter Spier

There is a translation of "The Flood" by Jacobus Revius, 17th Century Dutch poet, in the beginning of the book. The rest is wordless, with the story told through Spier's inclusion of much detail and humor in his illustrations. It invites much re-"reading" to absorb the complex incidents and careful sketching which Spier has included.

There is much in the book that invites interpretation by young artists. The ending is particularly apt as Noah, on his knees, is replanting the sodden earth while the beginnings of a rainbow frame him, the animals and his family.

Specific activities that adapt well to this book are:
Fish Mobiles (9)
Flannelboard Ark (10)
Listening Center (14)
Refrigerator Carton Ship (16)
Ship's Cross-Section (19)
Slide Center (19)
Stained Glass Pictures (20)
Stained Glass Rainbow (20)
Stuffed Sea Animals (21)
Transparent Film Art (21)
Wood Construction (22)
Wood Painting (22)

Ages 4 and up
Doubleday, Garden City, New York, 1977

The Cay
Theodore Taylor

This is a story of survival and of human interrelationships. Phillip Enright lives with his father and mother in Willemstad on Curacao at the beginning of World War II. His mother is frightened for his safety once enemy submarines are sighted in the area and she and Phillip board a small freighter to take them back to the United States. The ship is torpedoed and sunk. Phillip receives a blow on the head and, when he recovers consciousness, he is on a raft with an old, black man named Timothy and a cat. Later Phillip becomes blind. This is the story of Timothy's and Phillip's survival on the raft and later on a Caribbean cay.

Specific activities which adapt well to this book are:
- Blah (7)
- Concentration (7)
- Discovering Latitude and Longitude (8)
- Flag Bingo (10)
- Food Chain Game (11)
- Fun Folders (12)
- Hurricane (12)
- Hurricane Tracking (13)
- International Flag Alphabet (13)
- Knot Tying (14)
- Locate It (14)
- Match-Up Card Game (15)
- Net Making (16)
- Seashell Identification (17)
- Shark Game (18)
- Slide Center (19)
- Survival Skills (21)
- Transparent Film Art (21)
- Weaving (22)

Ages 10 and up
Doubleday, Garden City, New York, 1969

Christopher Columbus
Piero Ventura

This is an information book about Columbus, his ships and the voyage to the new world. It includes carefully detailed full-color illustrations, such as a cross-section of the Santa Maria and examples of housing in both the old and new worlds. Although the drawings are excellent, the book probably would not hold up well for general classroom use; its binding is weak and not designed for durability.

Specific activities that adapt well to this book are:
- Beneath the Mast (6)
- Blah (7)
- Concentration (7)
- Discovering Latitude and Longitude (8)
- Flannelboard Ark (10)
- Fun Folders (12)
- Locate It (14)
- Match-Up Card Game (15)
- Refrigerator Carton Ship (16)
- Sea Vessel Match-Up (18)
- Ship's Cross-Section (19)
- Wood Construction (22)
- Wood Painting (22)

Ages 5 and up
Random House, New York, 1978

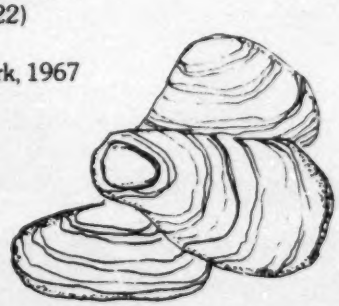
Seashore Story
Taro Yashima

In the Japanese legend, Urashima, the fisherman, saved the life of a sea turtle. In gratitude, the turtle carried Urashima to the bottom of the sea where he lived many days in a castle more beautiful than he had ever imagined. There came the day when he yearned to return to the earth, to his family and the warmth of the sun. When he did, he found his family and his home gone, only the mountain remained the same.

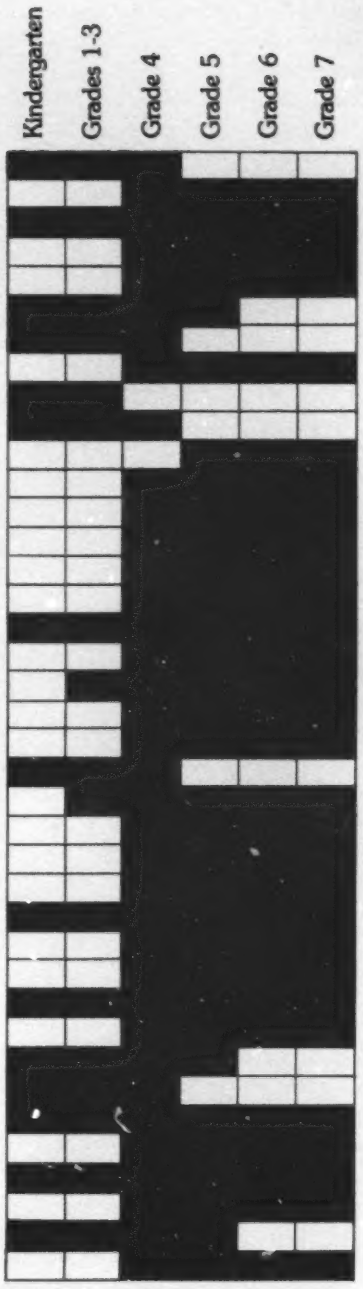
The ethereal colors in Yashima's paintings can inspire young artists to explore various art media in their interpretations of seascapes.

Specific activities that adapt well to this book are:
- Fish Mobiles (9)
- Listening Center (14)
- Sand Painting (16)
- Sea Creature Game (18)
- Shell Wheels (19)
- Stained Glass Pictures (20)
- Stained Glass Rainbow (20)
- Stuffed Sea Animals (21)
- Survival Skills (21)
- Transparent Film Art (21)
- Wood Painting (22)

Ages 4 and up
Viking Press, New York, 1967



Interest Center Activities



	Page
Beneath the Mast	6
Blah	7
Browsing Table	7
Concentration	8
Discovering Latitude and Longitude	8
Elementary Physics and Engineering	9
Fish Mobiles	9
Flag Bingo	10
Flannelboard Ark	10
Flotation Experiments	11
Food Chain Game	11
Fun Folders	12
Hurricane	12
Hurricane Tracking	13
International Flag Alphabet	13
Knot Tying	14
Listening Center	14
Locate It	14
Match-Up Card Game	15
Model Island or Beach	15
Net Making	16
Refrigerator Carton Ship	16
Sand Painting	16
Seashell Computer	17
Seashell Identification	17
Sea Vessel Match-Up	18
Shark or Sea Creature Game	18
Shell Wheels	19
Ship's Cross-Section	19
Slide Center	19
Soap Carving	20
Stained Glass Pictures	20
Stained Glass Rainbow	20
Stuffed Sea Animals	21
Survival Skills	21
Transparent Film Art	21
Weaving	22
Wood Construction	22
Wood Painting	22

NOTE: Some activities are appropriate for ages other than those indicated. Teachers can make necessary adaptations according to individual classrooms.

Basic Supplies for Activities

Large, sharp scissors
White glue
Rubber cement
Colored pencils
Masking tape
Index cards, 3" × 5"
Stapler
Ruler or straight-edge
Three sets of markers:
1. broad-tipped, permanent
2. broad-tipped, watercolor
3. fine-tipped, watercolor

Rubber bands
No. 2 pencils with erasers
Clear contact plastic *or*
laminating film and machine

1. Print clearly on everything. Cursive or fancy writing is difficult for some students to read. Words written completely with capital letters are difficult, too.
2. Use simple words when writing directions. Each student should be able to understand all directions independently.
3. Laminate (or cover with clear contact plastic) all materials. The quality, not the quantity, of materials is important.
4. Make the materials bright and colorful to appeal to the students. Unlined, colored index cards cost only 10 cents more per hundred than lined, white cards. The cost is worth it.
5. Make materials simple rather than ornate. Do not confuse students with unnecessary details or decorations.

Beneath the Mast

Level: K-4

Materials:

Plastic bleach bottle, cleaned and dried
Paper punch
Knife or scissors
Plastic tape or fabric
Notebook rings, one for each set of cards
Index cards (use different color for each deck)
Pictures, approximately ¾" × ¾"

Teacher:

1. Decorate the bleach bottle with plastic tape or fabric so it looks like a ship.
2. Make a folded cardboard stand, colored to resemble waves, so the bottle will stand on its side.
3. Cut a rectangular opening (½" × 2") in the top side of the bottle. Keep the lid on the bottle; the students will remove it to check their answers as they complete this activity.

4. Cut index cards into T-shapes, making sure the bottom strip fits into the opening in the bottle. Write a question or glue a picture at the crossbar of each "T." Write the answer or picture identification at least ¾" below the crossbar.
5. Punch a hole in the upper lefthand corner of the cards. When you have completed 10 or 12, clip them together with a notebook ring.

Students:

1. Remove the notebook ring from a set of cards.
2. Place each card into the opening in the ship. Identify the picture or answer the question.
3. To check your answer, remove the bottlecap and peek beneath the mast.
4. Continue until you have completed the entire set of cards.

Specific uses with particular books:

Spill — This is a good activity to check knowledge of western sea birds. You will need to draw or find pictures of birds mentioned in the story, such as the pelican, Western Grebe, gulls, etc.

The Craft of Sail — The knots pictured on pages 46-48 adapt well to this activity, as do the chart symbols on page 51.

Christopher Columbus — Younger students can use this activity to recognize plants of the new world. They also can identify the people working on Columbus' ship.

Blah

Level: 4-7

Materials:

24 index cards
Markers

Teacher:

1. Write questions or words to be identified on 20 index cards.
2. Draw or paste magazine pictures on three cards.
3. Make one "blah" card, as ugly or startling as possible.
4. This game is so simple that it may not be necessary to laminate the cards.

Students:

1. Shuffle the cards and place them face down on a table.
2. Choose a player to be first. He or she selects the top card and answers the question or identifies the word. If correct, the player scores one point; if not, no points are scored. Play continues to the left.
3. A picture card is a free card and scores three points.
4. Whenever a player turns up the "blah" card, that player loses and the game is over. The player with the most points wins the game.

Specific uses with particular books:

Spill—This can be used with specific questions, such as What is a cribina xanthogrammica (page 84), or How was the oil company working to clean up the oil spill (page 135). It also can be used for bird identification with students identifying pictures or particular characteristics.

The Craft of Sail — Kinds and/or parts of sails adapt well to this activity. You, or a student artist, can reproduce the drawings (pages 26-28). An alternative is to use the sailors' language (pages 24-25) which the students must identify.

The Cay — Three sets of cards are possible: one, the different kinds of ships; two, the various foods available; and, three, the shells mentioned.

Christopher Columbus — Cards depicting food identification and occupation identification can be used in both primary and upper elementary classrooms.

Browsing Table

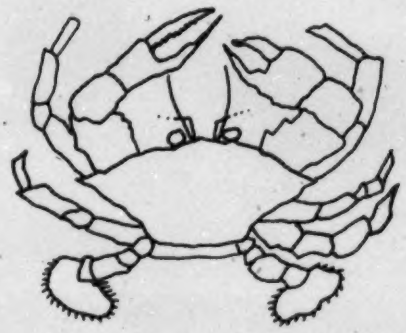
Level: K-7

Materials:

Marine-oriented picture books
Magazine articles with sea interest
Seashells
Brochures and pamphlets about the sea
Posters (see Low Cost Materials)

Teacher:

1. Place books, magazine articles, brochures and pamphlets on a table with some seashells in an inviting display so students can use their free time to learn about other marine books or special interests that will enhance their marine education.
2. In addition to the eight books referenced, the following may be combined with others of the teacher's own choosing:
   Isaac Asimov, **ABC's of the Ocean**
   Alice Goudey, **Houses from the Sea**
   Thor Heyerdahl, **Kon-Tiki**
   Katherine List, **Questions and Answers about Seashore Life**
   Millicent E. Selsam, **Animals of the Sea**
   Millicent E. Selsam, **Birth of an Island**
   These books are described in detail in the bibliography. Magazine articles from **National Geographic, National Geographic WORLD** and **Texas Parks & Wildlife** will be of interest to students. Appropriate brochures and pamphlets are described in the section on free materials.
3. Only picture books or articles with a number of illustrations are best for the primary grades. In upper elementary classrooms, some advanced reading books can be included and students can be encouraged to check these out for home reading. Picture books also should be displayed because older students enjoy studying the art and frequently do not feel comfortable looking through picture books in the school or public library.



Concentration

Level: 4-7

Materials:

International flag guide (see appendix)
52 3" × 5" cards, either index cards or white posterboard
Red, blue, yellow and black watercolor markers

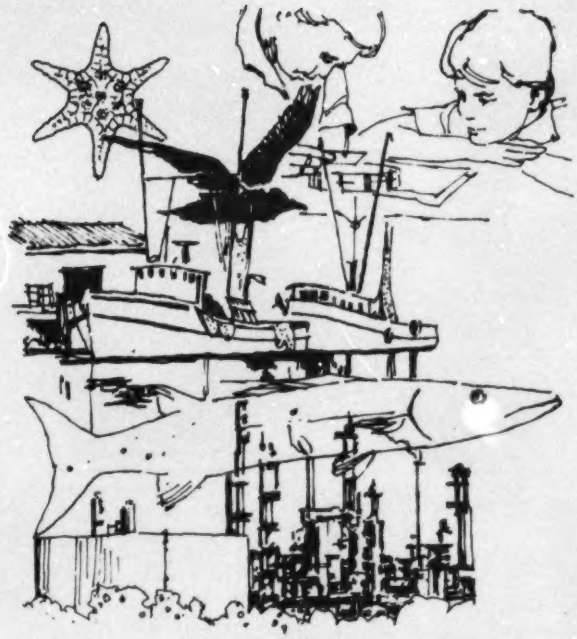
Teacher:

1. Using the international flag guide, make a flag representing each letter of the alphabet on 26 cards.
2. Use the remaining cards to write each letter of the alphabet.

Students:

1. Place the cards face down on the table in rows.
2. Choose a player to be first. He or she turns up two cards. If they match (if the flag represents the letter), the player keeps those cards and picks two more.
3. If the cards do not match, they are replaced in the same spots and play continues to the left.
4. The player with the most pairs when time is called is the winner.

Specific uses for particular books:
This activity adapts well to **The Craft of Sail, The Cay** and **Christopher Columbus** as described.



Discovering Latitude and Longitude

Level: 4-7

Materials:

Map and information about the Caribbean (mounted on posterboard)
Atlas
Pencils
The Cay
Questionnaires (see appendix)

Teacher:

1. The purpose of this activity is to explore locations, to learn to read maps, particularly in longitude and latitude, and to locate points given in **The Cay.**
2. Sources for maps are suggested in the Free Materials section of the appendix.

Students:

1. Using the research materials provided, explore the Caribbean and find out how accurate Theodore Taylor is in writing **The Cay.**

Specific uses with particular books:
The Craft of Sail — Combine the charts and symbols in this book with the information found in an atlas.
Island of the Blue Dolphins — Use maps of the California coast for the activity.
Christopher Columbus — Use either regional maps or a world map with the activity.

Elementary Physics and Engineering

Level: K-5

Materials:

Small glass bottle, partially filled with water tinted with food coloring
Paper or plastic soda straws
Scissors

or

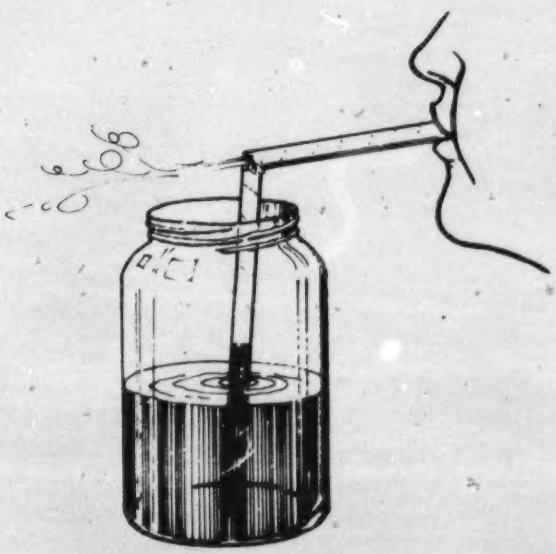
One piece of rope about 24 feet long (or two pieces, 12 feet each)
Heavy weight (a cement block or compact box of books works well)

Teacher:

1. The water and straw experiment demonstrates the Bernoulli effect, that pressure within a moving stream of fluid decreases if the fluid moves faster. This principle explains the lift of airfoils which cause planes to fly. It also explains the way sails work on ships.
2. The second experiment explains the principle of vectors.
3. These two principles explain how the wind works against a sail and how sailors use the principles to make the sailboat go in the direction they choose.

Students:

1. For the first experiment, cut a soda straw almost in half. Bend the straw and insert the lower end in the tinted water.
2. Blow into the upper end and watch the water rise in the lower portion of the straw.



3. For the second experiment, tie the rope around a heavy object, leaving about 10 feet free at each end.
4. If two students of equal strength pull in opposite directions, the weight will not move.
5. If the same two students pull at angles of less than 180°, they can cause the weight to move in a controlled direction.
6. If the students pull the rope in the same direction, they also can cause the weight to move in a controlled direction.

Specific use with particular books:

The Craft of Sail — The principles are illustrated on pages 10-17 and should be used for reference with all other books. For example, **Christopher Columbus** can be used in combination for a discussion on sailing ships.

Fish Mobiles

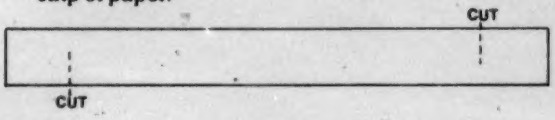
Level: K-4

Materials:

Scrap strips of paper in any colors
Scissors
Markers
Hole punch
Yarn

Students:

1. Make a cut with scissors (or tear) in each end of a strip of paper.



2. Fit the cut ends together.
3. Decorate the fish with markers or crayons.
4. Punch a hole in the fish, and string with yarn.
5. Suspend the fish from the ceiling, either individually or several in different sizes to make a mobile.

Specific uses with particular books:

Noah's Ark — Many kinds and sizes of fish are pictured on the cover and throughout this book which the students can use as examples. One possibility is for the students to use very large strips of paper to make whales.

Seashore Story — Because of the unusual and ethereal paintings in this book, the students may choose to paint their fish. Another idea would be to use gift wrap or other colored or patterned paper to make the fish.

Flag Bingo

Level: 4-7

Materials:

7" × 9" white posterboard (one for each student)
Red, blue, yellow, black markers
Ruler
Small pieces of posterboard for call letters
Washers, or other small objects, for playing pieces
International flag alphabet guide (see appendix)

Teacher:

1. Xerox the bingo card grid included in the appendix and glue onto posterboard for each student.
2. Fill in each square with an international flag symbol drawn with markers. Make each card different. (A sample card is included in the appendix.)
3. Make alphabet letters on small cards for the caller.

Students:

1. As a letter is called, check to see if it is on your bingo card. Remember it will be represented by a flag rather than the usual alphabet symbol. Check the guide sheet if you are not sure.
2. The first person to cover five squares horizontally, vertically or diagonally wins the game.

Specific uses with particular books:

The Craft of Sail and **The Cay,** or any others which mention signal flags, are particularly adaptable to this activity as described.

Flannelboard Ark

Level: K-3

Materials:

Flannelboard
Ark cut out of brown felt
Pellon cut into 3" or 4" squares (available at fabric stores; cheapest works best)
Watercolor markers
Scissors

Teacher:

1. Copy and enlarge the Noah's Ark in the appendix and cut out of brown felt. Place on flannelboard.

Students:

1. Using markers, draw an animal or fish on the pellon square to add to Noah's Ark.
2. Cut out the animal or fish.
3. Place the animal or fish on or near Noah's Ark on the flannelboard.

Specific uses for particular books:

Noah's Ark — In this direct adaptation, students populate the ark with animals of their choice. You may choose to make Noah yourself, but do not make him so polished that the students are intimidated.

Christopher Columbus — The students can make the sails for Columbus' ship, then add the people and things stored in the ship.

Flotation Experiments

Level: K-4

Materials:

Plastic dishpan, half-filled with water
Paper clips
Small aluminum disposable pans
One eye dropper
Liquid food coloring

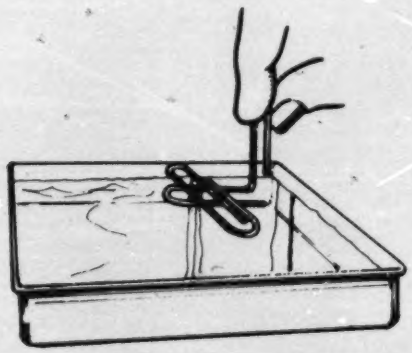
Teacher:

1. Involve the students in a general discussion of what things will float:
   a. Will paper clips float?
   b. Will aluminum pans float?
2. Discuss the effects of water pollution.

Note: These experiments are intended to stimulate thinking among young children. Answers need not be provided; it is more important that students ponder these things and experiment.

Students:

1. Bend one paper clip so it will support a second paper clip. Carefully lower the two paper clips onto the surface of the water. Will the supported one float? Why?



2. See if an aluminum pan will float on the water. Now punch a hole in the bottom of the aluminum pan. Will it still float? Punch two holes in the pan and try again, then punch several holes in the pan. Will it still float? Why?
3. Drop liquid food coloring into the water. What happens when the drop of color enters the water? Does the color stay in one place? Does the same thing happen to bigger bodies of water when waste material is dumped? Should we be concerned about it?

Specific books:

The Craft of Sail, Noah's Ark, Christopher Columbus and **Seashore Story** work well with these experiments as described.

Food Chain Game

Level: 5-7

Materials:

Cloth streamers, about 2" × 18", in three different colors
24 to 30 plastic sandwich bags
Plastic produce bags
Dried beans or styrofoam packing material
Scoreboard and magic marker

Teacher:

1. This is an outdoor game to illustrate the food chain and show how it can be upset by destroying the natural balance of nature.
2. Mark the sandwich bags with two strips of tape or magic marker at one-inch intervals from the bottom.
3. Mark the produce bags approximately two-thirds from the bottom.

Students:

1. Set boundaries for the playing area and a five-minute time limit.
2. Divide into three teams — Shrimp, Egrets, Alligators — and tie a different colored streamer to the wrist, belt loop, etc., to identify team members.
3. Shrimp and Egrets have plastic sandwich bags to represent their stomachs. Alligators, which are larger, use plastic produce bags.
4. Spread the beans, which represent plankton, around the area.
5. Shrimp stomachs are filled when beans or styrofoam reaches the first line on the sandwich bag. Egrets' stomachs are filled when the captured shrimp stomachs reach the second line on the bag. Alligators' stomachs are filled when the captured egrets' stomachs reach the line on the produce bag.
6. Once a player is tagged, he or she is out of the game.
7. One of each species must survive to maintain the ecosystem. Survivors are those left in the game at the end of the time limit whose stomachs (or bags) are filled to the line indicated. Record the number of survivors on the scoreboard.
8. After the first game, players can change one rule to see if the balance of nature can be restored so there will be survivors in each group.

Specific uses with particular books:

Spill — Because this book concerns the destruction of life caused by an oil spill, this game is appropriate as students consider survival techniques.

The Cay — This book deals less with natural survival, but the game is effectively played and understood by students who have discussed nature's food chain.

Fun Folders

Level: 4-7

Materials:

Paperback activity book (available at most grocery stores)*
8 to 10 file folders
Clear contact plastic
Scissors
Construction paper
Rubber cement
Watercolor markers
Wipe-off markers or grease pencil for students
Facial tissue

Teacher:

1. Cut out one activity page for each fun folder and mount it on colored construction paper with rubber cement. Glue the construction paper to the right inside half of the file folder and cover the activity page with clear contact. Be sure to leave the center fold free.
2. Glue the answer to the left side of the file folder and cover it with a flap of construction paper.
3. Label the activity on the extended edge of the folder; leave the outside of the folder plain.
4. Store in an envelope or box that is easily accessible to students. An empty thermofax box, covered with colored contact, is ideal. Keep each set of fun folders separate.
5. Try to include different levels (easy to difficult) and different interest items (math, reading, puzzles) in each set.

Students:

1. Choose the folders you want to do.
2. Use a wipe-off marker or grease pencil to fill in your answers.
3. Check your answers, then rub off your answers with a damp tissue and return the folder to its case when you are finished.

*Materials used are from **The Shark Activity and Game Book** by Tony Tallarico, Grosset and Dunlap, 1975.

Specific uses with particular books:
Island of the Blue Dolphins and **The Cay** adapt well to fun folders made with this activity book since both include sharks.
Since the activity books are usually inexpensive (less than $1.00), teachers may want to purchase others with sea themes which can be adapted to other books.

Hurricane

Level: 4-7

Materials:

International flag guide (see appendix)
53 3" × 5" white posterboard cards (index cards may be used if they are heavy enough so markings do not show through)
Red, blue, yellow and black watercolor markers

Teacher:

1. Make a flag representing each letter of the alphabet on 26 cards, using the international flag guide.
2. Use another 26 cards to write each letter of the alphabet.
3. Use the last card to draw the flag symbol for a hurricane.

Students:

1. Two to five may play.
2. Shuffle and deal all cards. This game follows the same rules as "Old Maid," matching letters with their international flag symbols to make pairs.
3. The player holding the hurricane card at the end of the game loses.

Specific uses with particular books:
This activity, as described, adapts to **The Eyes of the Amaryllis** and **The Cay.**

Hurricane Tracking

Level: 4-7

Materials:

Xeroxed copy of hurricane information from encyclopedia
The Cay
Questionnaire on hurricanes (included in appendix)
Pencils
A chart with newspaper tracking records of past hurricane
Hurricane tracking chart (see appendix)

Teacher:

1. Either xerox hurricane information from the encyclopedia or have the book nearby opened to this section. (Author's note: I mounted xeroxed pages from **The Book of Knowledge** in a heavy folder with a model of hurricane warning flags.)
2. **The Cay** is used as a reference tool so the students can discuss Theodore Taylor's description of the storm and compare it with an actual storm.
3. A sample hurricane tracking chart is included in the appendix. This can be copied for each student, or a source for free charts is listed in the Free Materials section of the appendix.

Students:

1. Using the reference tools provided, answer the questions about hurricanes.
2. Use the tracking chart to chart the course of an actual hurricane or the one described in **The Cay.**

Specific uses with particular books:

The Craft of Sail — Although a hurricane is not described, this book gives good information on reading charts and on warning signals (pages 50-59) to use with other books or with a hypothetical hurricane.

The Eyes of the Amaryllis — Students may want to draw in that part of the Atlantic coast where the storm in the book takes place, but actual tracking will need to be for a hypothetical hurricane or from newspaper accounts.

The Cay — Definite wind directions and locations are given in this book. Students cannot track a hurricane as accurately as with newspaper accounts, but they will be able to learn the principles involved.

International Flag Alphabet

Level: 4-7

Materials:

Sample set of international alphabet flags
International flag guide
Scissors
Rulers
Rubber cement or white glue
Construction paper (yellow, white, red, blue, black)

Teacher:

1. Make a sample set of international alphabet flags from construction paper. Five inches square is a good size. This set also should be laminated or covered with clear contact plastic for protection.
2. An international flag guide is included in the appendix; you also can find a guide in the encyclopedia or can send for a free copy from the source listed under Free Materials in the appendix.

Students:

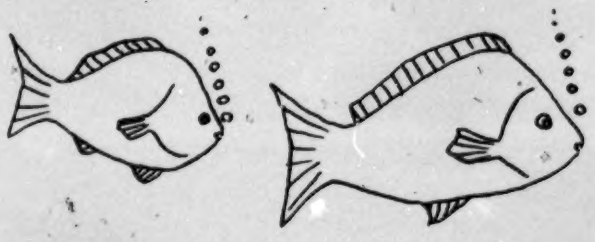
1. Using the sample flag set as a guide, choose the letters you want to make.
2. Cut out the shapes you need in the correct colors of construction paper.
3. Glue the shapes together to make the flag symbols.

Option

1. Use colored markers and paper to write longer messages.

Specific books:

The Craft of Sail and **The Cay** are appropriate for this activity.



Knot Tying
Level: 4-7

Materials:

Illustrations of three basic sailor's knots with descriptions (see appendix)
One piece of rope, three to four feet long, for each student

Teacher:

1. This activity teaches the basic knots used by sailors, the function of each and the importance of each to survival.
2. If a group is working in the knot tying center, it is preferable to make a thermofax transparency of the knot tying illustrations so the chart can be enlarged for easier reference.
3. The students should be able to master the square knot, bowline knot and clove hitch. They also should learn to distinguish between the square knot and granny knot and understand why the granny knot is unsafe.

Specific uses with particular books:
Because knot tying is such an integral part of any sea story, this activity works well in all upper elementary classrooms. It adapts particularly well to **The Craft of Sail, Island of the Blue Dolphins** and **The Cay.**

Listening Center
Level: K-7

Materials:

Cassette tape recorder
Cassette tapes of sea noises, sea animals and sea chanties (see resource references in appendix)

Teacher:

1. Set up the tape recorder in a corner of the room so children can listen individually or in small groups.
2. Listening to the sea sounds may lead to creative writing or artwork; supplies for these extended activities should be available.
3. It is wise to take the precaution of punching out the necessary part of each tape to be sure students do not erase the tapes.

Specific use with particular books:
This activity is designed to be used with any of the eight books described.

Locate It
Level: 4-7

Materials:

One sheet of posterboard
Simplified world map
Thermofax and overhead projector
Exacto knife
Plastic tape in several colors
12 white or black 24" shoestrings

Teacher:

1. Make a thermofax transparency of a world map (either the one in the appendix or one you draw yourself).
2. Project the map with the overhead onto the bottom half of the posterboard. Trace with a No. 2 pencil.
3. Trace over the pencil lines with a heavy, permanent, broad-tipped marker. Keep the lines simple with a minimum of detail.
4. Choose 12 places for the students to locate on the map. Make sure they are scattered over the map rather than clustered in one place.
5. Make a list of these places at the top of the posterboard. Cut a hole with an Exacto knife next to the name of each place.
6. Cut slightly larger holes at each actual location on the map. Make sure these holes are big enough for easy manipulation by students.
7. Knot each shoelace. Thread one end through the posterboard next to the name of each place and secure the knot behind the name. Color-code the opposite end of the shoe lace with plastic tape.
8. Match each shoelace to its location by threading the lace through the corresponding hole. Color-code the location on the back of the posterboard with matching plastic tape (e.g., red-tipped lace should go through hole with red tape, etc.).

Students:

1. Match the place names with their locations on the map.
2. Slide each shoelace into its correct hole.
3. Check your work by matching the colors on the back.

Specific use with particular books:
This activity adapts well to nearly any book; you need only include the places named in each. It works particularly well with **The Cay** and **Christopher Columbus** because of the number of locations used in each story.

20

Match-Up Card Game

Level: 1-7

Materials:

12 to 20 index cards
Marking pens
Pictures and descriptions sized to fit cards
Rubber cement

Teacher:

1. Separate the pictures and descriptions.
2. Glue one picture to a card and the description to another card. Make from six to 10 pairs.
3. Make an identifying color mark on the backs of each pair of cards, using a different color or mark for each pair.
4. This game can be made with sharks, sea vessels, marine occupations, etc.

Students:

1. If playing alone, lay all cards face up on the table. Try to match each picture to its description. Check the backs of the cards to see if you are right.
2. If two people play, take turns. If the player correctly matches a pair, he or she keeps the cards. The person with the most cards at the end of the game wins.

Specific use with particular books:

The Craft of Sail — This activity can be used in several ways with this book. The chart symbols (page 51) are one example; sea way rules (page 61) are another; parts of the ship (pages 24-27), yet another. Many more ideas from this book will suggest themselves.

The Cay — Sea animal pictures and descriptions are one way this activity can be used with this book. Another is to find pictures of the foods available to identify.

Christopher Columbus — Foods of the new world and sailors and their specific occupations are two ways this activity can be used with this book.

Model Island or Beach

Level: 4-7

Materials:

Corrugated cardboard box or other heavy container
Saran or cellophane
Sawdust
Sand
Wheat paste (available at hardware stores) or white glue
Newspapers
Small twigs, bits of cloth
Construction paper
Pipe cleaners
Scissors
Shallow container for glue or paste
Pencils

Teacher:

1. Students need to be very familiar with the description of the island or beach they plan to make in miniature. This comes from careful reading of the selected book.
2. Tear the newspapers into strips in advance. Reserve some newspapers to use as protection for table or floor.
3. If using wheat paste, thin according to the manufacturer's directions. White glue should be thinned half and half with water.

Students:

1. After deciding what type of model will be built, make preliminary sketches on the bottom of the cardboard box or container.
2. Dip strips of newspaper into paste or glue solution and begin to build the island or beach according to the contours described in the book.
3. For finishing touches, sand and sawdust will stick to the damp papier-mache to represent sand and earth. Saran or cellophane crumpled over blue construction paper becomes the sea. Pipe cleaners with green construction paper leaves become palm trees.

Specific use with particular books:

Island of the Blue Dolphins — A model of Karana's hut can be added along with a duplicate of the whalebone fence.

The Cay — Bits of gravel can spell out a message from the book, or a raft, simple hut or water catchment can be added.

Christopher Columbus — Villages such as those in the book can be created by using small boxes to represent the houses.

Net Making

Level: 4-7

Materials:

Heavy twine or cording
6 feet of rope for headline
Empty paper towel or toilet tissue roll

Teacher:

1. This is one of the more difficult activities. Teachers should practice tying the knots themselves before presenting this center to their students.
2. Illustrations of the clove hitch and fisherman's netting knot are included in the appendix.
3. Because of the limitations of the twine, this activity will not result in a usable net. By adding more twine and rope and using a netting needle, an actual net can be produced.

Students:

1. Anchor both ends of the rope to a firm surface, leaving the center free and taut.
2. Begin with approximately 25 feet of twine. Tie the twine to the headline (rope) with clove hitches Loops can be made around the tissue roll to assure even loops. Make six or seven hitches.
3. Begin a second row of knots, moving in the opposite direction.
4. The fisherman's netting knot, also called the sheet bend, is made in succeeding rows of netting with each loop being pulled tight against the tissue roll to assure even net loops.

Specific use with particular books:
This adapts well to **The Eyes of the Amaryllis, Island of the Blue Dolphins,** and **The Cay** as described above.

Refrigerator Carton Ship

Level: K-4

Materials:

One refrigerator carton (or any large appliance box)
Markers
Large knife
Tempera paints

Teacher:

1. Although the students can plan how their ship will look and do all decorating, teachers should actually cut out the ship with a large knife.

Students:

1. Plan how the final ship will look.
2. Draw cutting lines on the carton with markers. Have your teacher cut out the ship.
3. Decorate the ship with tempera paints and markers. Sails can be made from white butcher paper and scraps from the cardboard box.
4. Use the ship for play acting or as a home for the Stuffed Sea Animals you make in another interest center.

Specific use with particular books:

The Craft of Sail — One of the simple sailboats in this book can easily be duplicated. Students may want to use poles to make masts (cardboard tubing from fabric stores works well) and sails.

Noah's Ark — A refrigerator carton makes an excellent ark. It can be filled with animals made from paper (see Stuffed Sea Animals) or cardboard.

Christopher Columbus — The Santa Maria, filled with provisions made by the students, is easily inhabited by the students who become the sailors. A water heater carton makes a good long boat for the Indians who came to meet Columbus.

Sand Painting

Level: 1-7

Materials:

Sand in two or more different shades (garden centers, nurseries, cement companies)
Paper plates or scrap lightweight cardboard (the backs of tablets or shirt cardboards work well)
White glue (mixed half and half with water)
Watercolor brushes
Pencils
Newspapers

Teacher:

1. Spread newspaper liberally around the area where the students will be working.

Students:

1. Sketch a design on a paper plate or cardboard. Simple designs work best.
2. Brush glue onto one area of the design and cover with one shade of sand. Wait a few minutes, then shake off excess sand.
3. Continue until you have filled in all areas you want to be that shade of sand.
4. Repeat steps two and three with other colors of sand.

Specific books:
Although this activity can be used with nearly any book on the sea, it works particularly well with **The Eyes of the Amaryllis, Island of the Blue Dolphins** and **Seashore Story** because they all describe the beaches in detail.

Seashell Computer

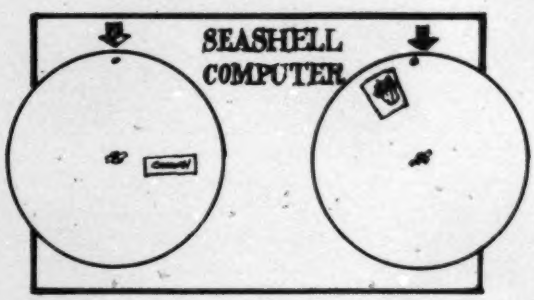
Level: 4-7

Materials:

15" × 18" posterboard
Two pieces of posterboard in a second color cut into 9" diameter circles
Colored markers
Shell pictures (eight or nine)
Two brads
Scissors
Rubber cement

Teacher:

1. Cut openings near the edge of each posterboard circle; one opening should be a ½" × 2" rectangle, the other should be a 2" × 2" square.
2. Attach each circle to the large posterboard with a brad so that the circles extend from the sides of the "computer."



3. Glue the shell pictures in equal segments on the large posterboard so one is exposed when the 2" × 2" opening is over the picture. Randomly write the names of the shells beneath the other circle so one is visible when the rectangular opening is over the name.
4. Match the shells with their names. As each pair is matched, give each an identifying mark (or color) at the top of the circle. Draw an arrow on the large posterboard pointing to the identifying mark. Repeat the identification until each shell is matched. Each pair will be matched when its color is under the arrow marker.
5. Decorate the posterboard to look like a computer. Laminate each piece separately.

Students:

1. Spin the circle of shells.
2. Turn the circle of names to match the color of the arrow to learn the name of each shell.

Specific use with particular books:

Spill—This activity has been used primarily with this book because of the time setting. It does adapt itself to any book of the sea set in the computer age, however.

Seashell Identification

Level: 4-7

Materials:

10 or more common shells
Box or other container to display shells
Fine-line permanent marker
Dittoed questionnaire list (see appendix)
Reference books*
Chart of shell numbers and places each can be found in the reference books

Teacher:

1. Accurately identify all shells in your collection.
2. Write a number on each shell with a fine-line marker.
3. Use the reference books to locate the page where each shell is pictured or described. (Author's note: I made a chart of the shells, the book titles and the page numbers where each shell was pictured. Several shells share characteristics which can be confusing to students.)
4. Arrange the shells attractively in a container. Several small boxes taped or glued into a larger, shallow box and covered with a soft cloth makes a sturdy and attractive display case.
5. It would be helpful to have shells from the particular locations named in each book, but it is not necessary. Students will learn from the reference books that shells differ according to the part of the world in which they are found.

Students:

1. Using reference books, questionnaire list and shells, look up the identification of each numbered shell.

Specific uses with particular books:
This activity adapts to **Spill, The Eyes of the Amaryllis, Island of the Blue Dolphins** and **The Cay.**

*Reference books used:

List, Katherine, **Questions and Answers About Seashore Life.** Four Winds Press, 1970.
Rice, Tom, **What Is A Shell?** Erco, Inc., Tacoma, Washington, 1975.
Zim, Herbert S. and Lester Igle, **Seashores: A Guide to Animals and Plants Along the Beaches.** Golden Press, 1975.

Sea Vessel Match-Up

Level: 4-7

Materials:

Posterboard
Small pictures of sea vessels and identifications (see appendix)
Marking pens
Hole punch
Six to eight shoelaces
Rubber cement
Plastic tape in various colors

Teacher:

1. Glue the sailing vessel pictures to the posterboard.
2. Punch a hole and tie a shoelace next to each vessel.
3. Write the name of each vessel along the bottom of the posterboard and punch a hole next to each name.
4. Color-code each vessel and its corresponding name by putting plastic tape on one end of the shoelace and on the back of the posterboard behind the correct name.

Students:

1. Match the sea vessel to its name by threading the shoelace from the vessel to the correct name.
2. Check the back of the posterboard to see if you are correct; the colors will match.

Specific uses with particular books:

The Craft of Sail — This activity can be adapted to match the different sails on any one ship or the different kinds of sailing ships.

The Eyes of the Amaryllis — Pictures, drawings or copies of 19th century sailing ships and small boats can be used with this book.

Island of the Blue Dolphins — Fishing craft, such as that used by the Aleuts who hunt otter in the book, work well with this book.

Christopher Columbus — Pictures, drawn or copied, of 15th century ships, long boats and canoes can be used with this book.

Shark or Sea Creature Game

Level: K-7

Materials:

Gameboard (available at school supply stores for about $2.00 or you can make your own with posterboard and an Exacto knife)
Playing pieces (also available at school supply store, about 10 for $1.00 in various colors)
Posterboard to back gameboard
Die or spinner
Index cards
Marker

Teacher:

1. Personalize the gameboard with pictures or stickers.
2. Depending on the number of blanks on the board, put a "Go back 2 spaces" or "Lose a turn" indicator every eight blanks. Put a "Go ahead 2 spaces" or "Take an extra turn" every five or six spaces.
3. There should be cards with questions/problems for the students to solve before moving on for the remaining blanks.
4. Make up 20 questions/problems on index cards. Questions may be on one side with answers on the reverse (so students can check their answers) or the answers can be on a separate answer sheet.
5. This game is suitable for both primary and upper elementary students. Primary students identify sea creatures pictured on the cards; upper elementary students answer questions about sharks.

Students:

1. Take turns as in any board game. Choose one player to start.
2. Place the question/picture cards face up on the gameboard.
3. Throw the die and move your playing piece ahead the indicated number of spaces. If you land on a blank space, you must answer the question on the top card. If you land on a space with printed instructions, follow those instructions. If you get the question wrong, go back one space.

Specific use with particular books:
This activity is appropriate for any of the books described.

Shell Wheels

Level: 4-7

Materials:

Posterboard cut into 9" or 10" diameter circle
Eight small seashells or pictures of shells
Eight clip-on type clothespins
Scissors
Permanent markers
Fine-line permanent marker
Ruler

Teacher:

1. Using a ruler or straight-edge, divide the circle into eight pie-shaped parts with the fine-line marker.
2. Glue a shell near the center of each part, leaving the border to clip on the clothespins.
3. Write the name of a shell on a clothespin with a fine-line marker.
4. Clip each clothespin to the posterboard adjacent to its matching shell. Turn the posterboard over (both pins and posterboard should be blank).
5. Using permanent markers, color a dot on the inside edge of each clothespin and match it to a dot on the posterboard. Use a different color for each set.

Students:

1. Match each shell on the wheel with a name printed on a clothespin. Clip the pin to the wheel by its shell.
2. Turn the shell wheel over to check your answers. The colored dots should match.

Specific use:
This activity can be used with any of the upper elementary books. The only requirement is that the students must be able to read the names of the shells and discriminate the colors on the back of the board and on each pin.

Ship's Cross-Section

Level: 4-7

Materials:

Posterboard
Picture of ship (x-ray type showing interior)*
Thermofax machine
Xerox machine
Overhead projector
Plastic tape (optional)
Scissors
Markers

Teacher:

1. Xerox the picture to be used and make a thermofax transparency. Use an overhead projector to project the enlarged picture onto posterboard.
2. Copy the projected image with a No. 2 pencil in as much detail as possible. Leave space for a title and for the questions.
3. Retrace the picture with markers and erase all pencil marks.
4. Use strips of plastic tape or contrasting markers to extend a line from the point on the picture to be identified to one inch beyond the edge of the ship. Number each line.
5. Mount the xeroxed picture on a smaller piece of posterboard, number it the same as the large picture and fill in the answers.

Students:

1. Identify the parts of Columbus' ship.
2. Check your answers with the smaller copy of the picture.

*The picture included in the appendix is from **Christopher Columbus** by Piero Ventura, New York: Random House, 1978. Encyclopedias or other reference books can provide additional examples, such as an ocean liner or Noah's Ark. Illustrations from **The Craft of Sail** and **Noah's Ark** also can be used.

Slide Center

Level: K-7

Materials:

Slide projector
Color slides of marine life with printed guide
Posterboard or large sheet of paper for screen
Masking tape

Teacher:

1. Set up the slide projector on the floor in a corner of the room. Put in the carousel of slides and have the printed guide nearby.
2. Allow the children to focus slides onto paper or posterboard which they can tape to the wall with masking tape. This projects the slides only onto a small area which is best for individual or small group viewing.
3. If the students have never operated a projector before, they may have a tendency to flip through the slides at first to try out the power of the equipment. Generally, this does not last long; they soon settle down to actually enjoy the slides.

Specific use with particular books:
This activity corresponds with all the books described.

Soap Carving*

*Restricted to students in grades four and above and to groups of four or less at any one time.

Materials:

Ivory soap, one bar for each student
Pocket knives, one for each student

Students:

1. Using clear pictures from reading books, plan and carve a sailing vessel from soap.
2. When finished, the ship will float on water. Some of the soap will dissolve, however, so you may wish to keep the carving for display purposes only.

Specific uses with particular books:

The Craft of Sail — The illustrations in this book lend themselves to this type of interpretation as students duplicate the drawings in soap.

The Eyes of the Amaryllis — The figurehead of the **Amaryllis** is a natural subject for soap carving. Reference books showing different kinds and styles of figureheads may be helpful.

Island of the Blue Dolphins — Although Karana did not have a carving compound to interpret her images of the world, it is possible for students to recreate her need for beauty in this media.

Stained Glass Pictures

Level: K-5

Materials:

7" × 9" clear contact plastic, two pieces per student
7" × 9" construction paper, one per student
Tissue paper in several colors

Teacher:

1. Precut construction paper into a picture border.
2. Cut tissue paper into tiny pieces. Separate colors in individual margarine tubs.

Students:

1. Remove backing from one piece of clear contact plastic.
2. Place contact plastic, sticky side up, on table. Carefully place border on contact.
3. Drop tissue paper pieces in a pattern within the border.
4. Remove backing from second sheet of contact and place sticky side on picture.
5. Hang the picture from the ceiling or place in a window.

Specific uses with particular books:

Island of the Blue Dolphins — Much of the imagery in O'Dell's story can be interpreted through this media, such as the sheen of the cormorant feathers, the shape of the island and the view of the sea.

Noah's Ark — Multi-colored fish or the rainbow are possibilities with this book.

Seashore Story — The pictures in this book will suggest many ideas, particularly the underwater and beach scenes.

Stained Glass Rainbow

Level: K-4

Materials:

8½" × 11" ditto paper, one sheet per student
Crayons
Baby oil
Newspapers
Paper towels
Stapler
Scissors
9" × 12" construction paper frame

Teacher:

1. Spread newspapers to protect table surfaces.

Students:

1. Color a rainbow or sea picture on ditto paper. Press hard with crayons.
2. Turn picture over on newspaper, squirt about one teaspoon of baby oil onto the paper and spread the oil with your fingers.
3. Blot the baby oil with paper towels. Don't rub.
4. Cut a picture frame from construction paper.
5. Staple the picture onto the frame.
6. Mount on a window.

Specific uses with particular books:

Noah's Ark — This activity, like this book, is quite good for younger students because it is one they can manage easily. The rainbow is particularly appropriate because it is translucent, as a rainbow is.

Seashore Story — Many of the illustrations in this book can be duplicated with this activity.

Island of the Blue Dolphins — With older elementary students, this book generally invites much artistic interpretation that is suited to this activity.

Stuffed Sea Animals

Level: K-7

Materials:

Transparencies of sea animals*
Overhead projector
Butcher or kraft paper, cut or torn to about 20" × 30"
Marking pens or crayons
Stapler and lots of staples
Masking tape
Scissors
Hole punch
Yarn

*Thermofax transparencies can be made of the sea animals included in the appendix, or the teacher or students can draw their own.

Students:

1. Choose the animal transparency you want to use.
2. Place the transparency on the overhead projector and tape a large sheet of paper to the wall as your screen.
3. Trace the picture on the paper.
4. Remove the paper from the wall and color the animal.
5. Hold another piece of paper behind the picture and cut out the animal from both sheets. Save the scraps of paper for stuffing.
6. Staple the top half of the animal together.
7. Begin stuffing the animal with the torn and crumpled scraps of paper.
8. Continue stapling and stuffing the animal until it is finished.
9. Punch a hole in the center top of the animal and hang it from the ceiling with yarn.

Specific uses with particular books:

The Eyes of the Amaryllis and **Island of the Blue Dolphins** can be combined with this activity in the upper elementary grades.

Noah's Ark and **Seashore Story** provide many examples for animals and marine creatures for the primary students. Younger students often prefer to draw their own animals, otherwise, follow the activity as outlined.

Survival Skills

Level: 4-7

Materials:

Small box filled with various items which might be found in a person's pockets:

Handkerchief
Dollar bill
Small knife
Pencil
Rubber band
Safety pin
Piece of string
Key
Paper clip
Old buckle
Book of matches

Questionnaire for each student (in appendix)
Pencils

Teacher:

1. Allow ample time for the students to study the items in the box. They should be free to touch all the items and to think for a while.

Students:

1. After examining all the items in the box, answer the questions on the printed sheet.

Specific uses with particular books:

Island of the Blue Dolphins — Since Karana would not have access to the materials listed, change the items to include a sharp stick, a flat rock, an oyster or mussel shell, a small bone or a similar item that could be honed into a needle.

The Cay — The items and questionnaire listed are used with this book.

Transparent Film Art

Level: K-7

Materials:

Ditto paper
Pencils
Permanent markers
Transparencies for overhead projector
Old shirts (for younger children)

Teacher:

1. Although this activity requires little advance preparation, keep in mind that permanent markers can damage clothing so the children need to be careful. Old shirts make good coverups and generally the children can bring these from home.
2. A source for free transparent film is suggested in the Free Materials section of the appendix.

Students:

1. Draw pictures on ditto paper to recreate scenes from **The Cay** or to represent other marine ideas.
2. Trace the picture on transparent sheets with permanent markers.
3. Display the picture on the overhead projector and then hang it on the windows in the classroom.

Specific use with particular books:

This activity works well with any of the books described.

Weaving
Level: 4-7

Materials:
Kindergarten weaving looms
(Fabrication instructions in **Art Activities for the Very Young** by F. Louis Hoover or commercial weaving looms can be purchased)
2" × 14" cloth strips in various textures and colors
Blindfolds
Yarn strung on looms as warp

Teacher:
1. This activity is most appropriate with the teaching module based on **The Cay.** Since Phillip was blinded in this story and because he was expected to weave mats for himself and Timothy to sleep on, the students can experience how difficult this task is.
2. The first strip will be fairly easy for the students to weave through the warp, even blindfolded. As they continue, however, the task becomes much more difficult and they will gain insight into how it actually feels to be blind.

Students:
1. Set up the loom and strips of cloth to weave a mat.
2. Have the teacher or another student blindfold you.
3. Weave a small mat as Phillip wove sleeping mats for Timothy and himself in **The Cay.**

Specific uses with particular books:
Island of the Blue Dolphins — In Chapter 12 Karana weaves strands of bull kelp to strengthen her fence and reeds to make a basket. If available, gather reed-like grasses for the students to use with this activity.
The Cay — This activity was developed particularly for this book. You may want to experiment with reed-like grasses if they are available.

Wood Construction
Level: K-5

Materials:
Scrap lumber in various sizes
Hammers
Nails (those with reasonably large heads are easiest for children)
Small saw
Workbench or other sturdy table

Teacher:
1. Set up a place where the students can work and where their noise and mess will not disturb others.
2. Supply the materials listed.
3. Remember that it is the process, not the finished product, that is important.

Students:
1. Using sea books as guides, build your own sailing vessel.

Specific uses with particular books:
The Craft of Sail — The pictures in this book are an excellent guide for young carpenters trying to build their own ships.
Noah's Ark — Since Noah was able to build an ark, the students may want to try as well. The pictures in the book provide a good guide.
Christopher Columbus — Students can re-create either one of Columbus' ships or one of the long boats used by the Indians.

Wood Painting
Level: 4-7

Materials:
Scrap lumber in various sizes
Tempera paints
White glue
Brushes

Teacher:
1. Mix two parts water and one part white glue with dry tempera to help the paint stick to wood and also to give it a slightly glossy finish.

Students:
1. Choose a piece of wood for your painting.
2. Plan your seascape painting.
3. Paint the seascape with the tempera and glue mixture.

Specific uses with particular books:
The Eyes of the Amaryllis — The figurehead on the **Amaryllis** provides a good beginning point for experimentation with color on wood grain.
Noah's Ark — Students can recreate scenes from the ark.
Christopher Columbus — The scenes in this book lend themselves to this medium; the wood tones in the ships will be duplicated in this activity.
Seashore Story — Students should be free to interpret this book at will, although it probably will suggest colorful pictures with sprawled lines.

Appendix

Questionnaires
- Discovering Latitude and Longitude 24
- Shell Identification 25
- Survival Skills 26
- Hurricanes 27

Illustrations
- Flag Bingo Card 28
- Flannelboard Ark 30
- Hurricane Tracking Chart 31
- International Flag Guide 32
- Net Making Knots 33
- Sample Knots 34
- Sea Vessels 36
- Ship's Cross Section 41
- Stuffed Sea Animal Patterns 42
- World Map 45

Free Materials 46

Low Cost Materials 48

Bibliography 49

Discovering Latitude and Longitude

In **The Cay** Timothy estimates the location of the cay he and Phillip landed on (page 63, Avon paperback, and pages 58-59, Doubleday edition). Can you find it on the map?

What specific reference tools do you need?

Timothy talks to Phillip about the coral banks (page 64, Avon paperback, and page 61, Doubleday edition). Why do they seem so bad?

What is the distance from Curacao to Florida?

What is the distance when traveled by steamer?

How can you tell?

What is located at 30°31' N, 96°30' W?

Why are locations like this more important on sea than on land?

What is the location of a favorite place you like to visit — in latitude and longitude?

30

Name _____

SHELL IDENTIFICATION

Name of shell	Identifying feature
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____

Survival Skills

Handkerchief	Rubber band	Paper clip
Dollar bill	Safety pin	Old buckle
Small knife	Piece of string	Book of matches
Pencil	Key	

1. If you had these items in your pocket when your ship sank, how would you use them for your survival?

2. Which items are the most useful? Why?

3. If you could only have one of these items, which would it be? Why?

4. What items would be of no use to you? Would you throw any away?

5. What would you like to have in your pocket if you had to survive on an island all by yourself?

Name _____

Hurricanes

Theodore Taylor describes the hurricane in chapters 14 and 15 (pages 101-112) in **The Cay.**

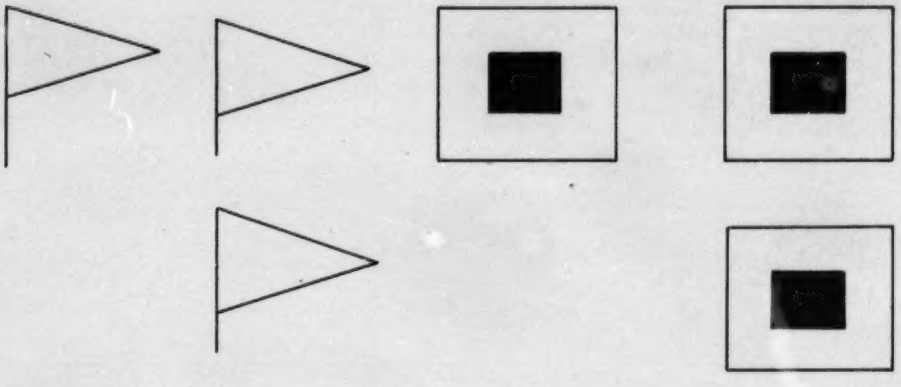
Using the hurricane reference material, tell if you think Mr. Taylor was accurate in his description of the storm.

Was the wind direction correct? (See map)

How big do you think the eye of the hurricane was?

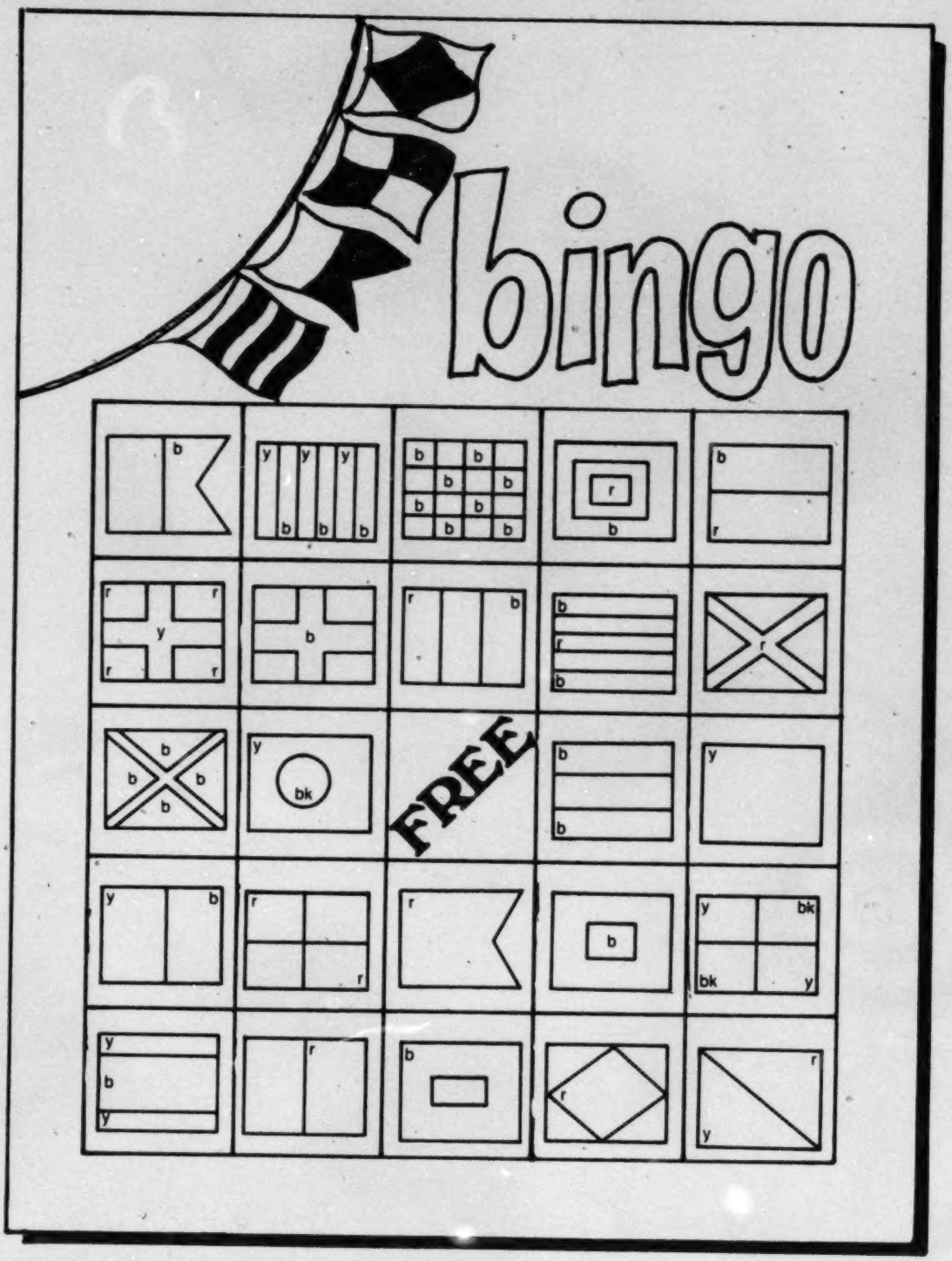
Why do you think that?

These warning signs indicate different wind forces. Name the signs and tell the wind speed for each.

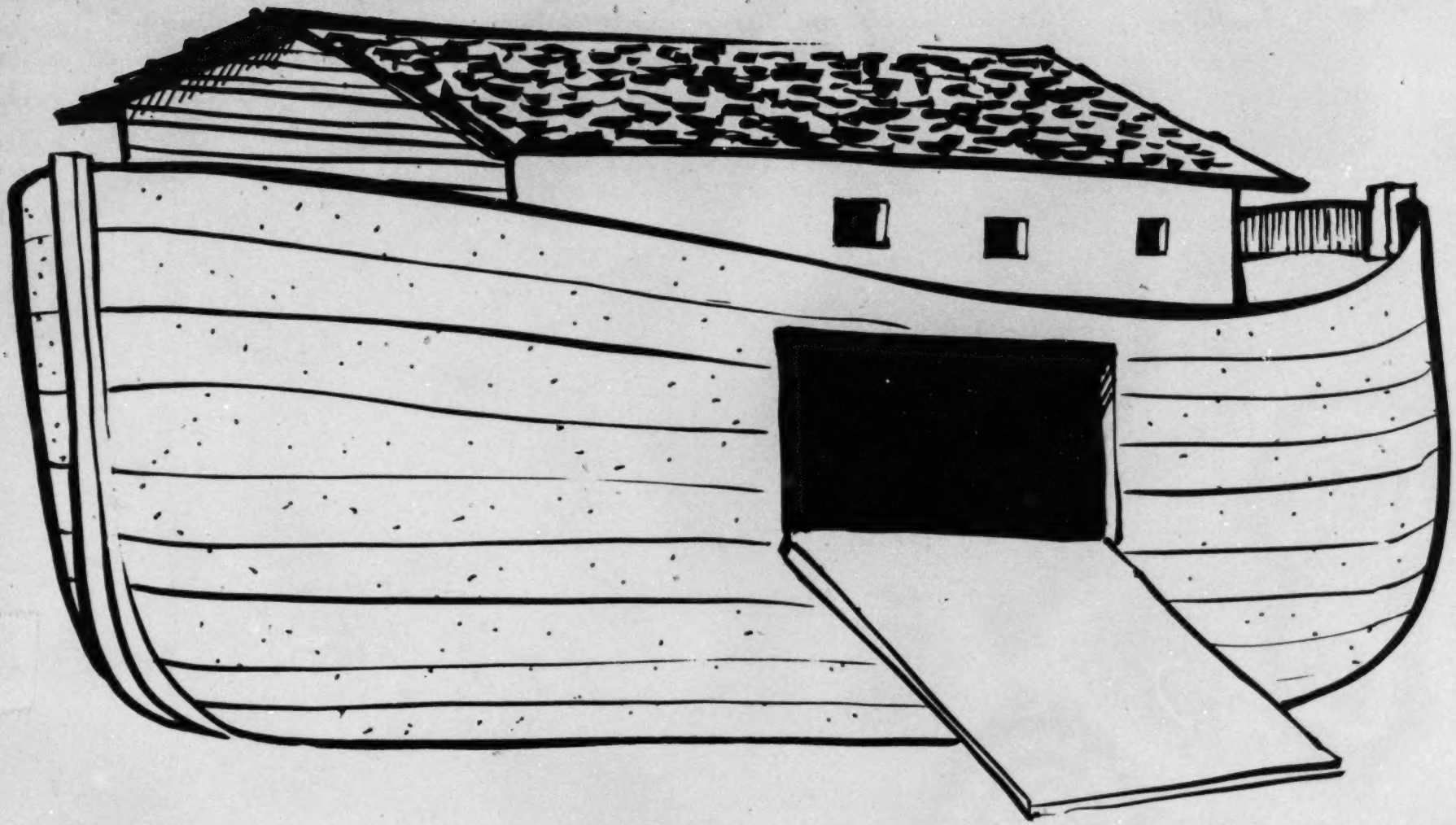


Color the warning signs if you like, using accurate colors.

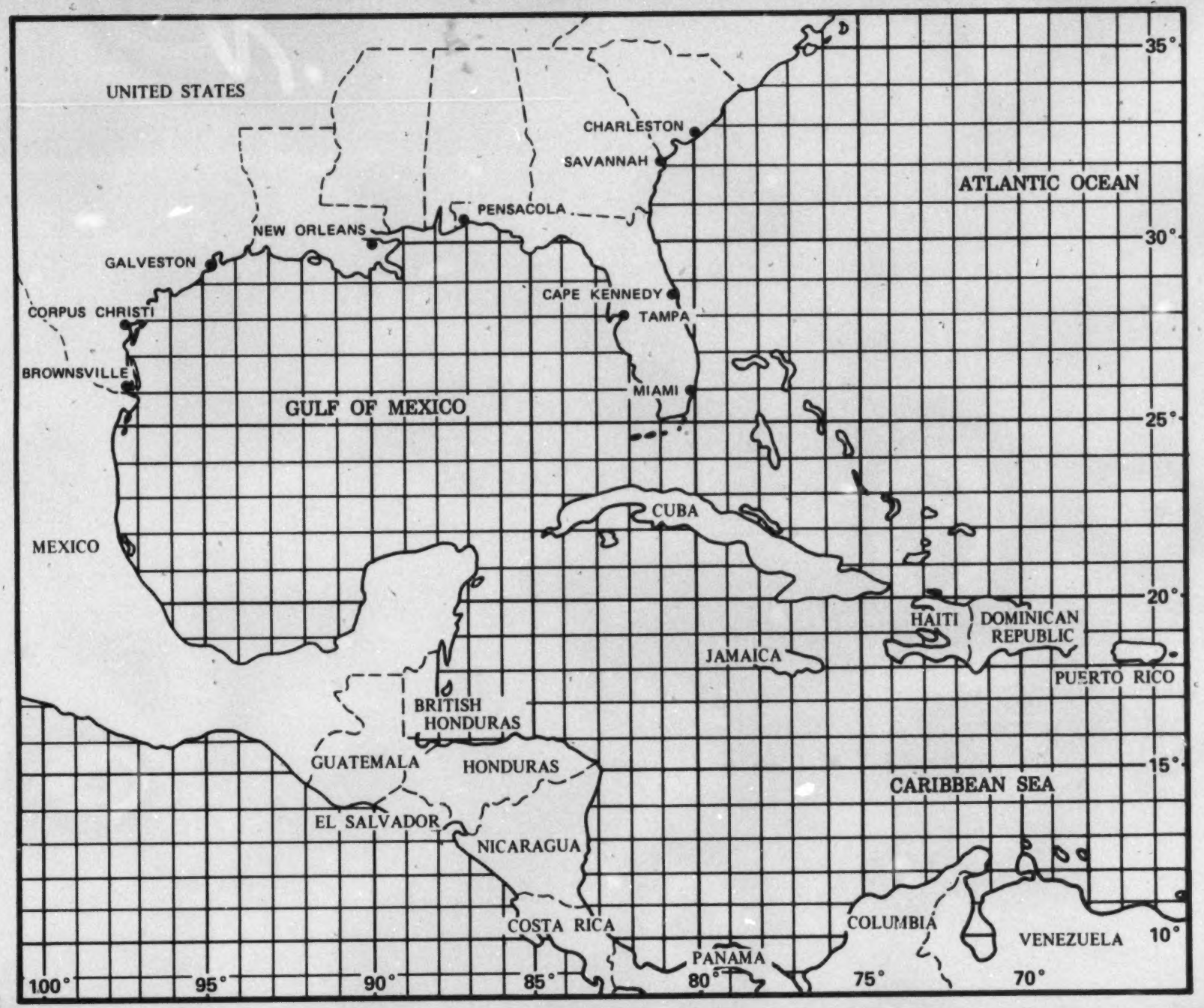
bingo
FREE



Sample Card



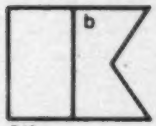
Noah's Ark


UNITED STATES
CHARLESTON
SAVANNAH
ATLANTIC OCEAN
PENSACOLA
NEW ORLEANS
GALVESTON
CAPE KENNEDY
TAMPA
CORPUS CHRISTI
BROWNSVILLE
MIAMI
GULF OF MEXICO
CUBA
MEXICO
HAITI
DOMINICAN REPUBLIC
JAMAICA
PUERTO RICO
BRITISH HONDURAS
GUATEMALA
HONDURAS
CARIBBEAN SEA
EL SALVADOR
NICARAGUA
COSTA RICA
COLUMBIA
VENEZUELA
PANAMA
35°
30°
25°
20°
15°
10°
100°
95°
90°
85°
80°
75°
70°

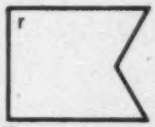
INTERNATIONAL FLAGS AND PENNANTS

Leave white | r Color red | b Color blue | y Color yellow | bk Color black

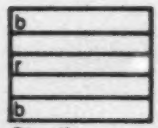
ALPHABET FLAGS



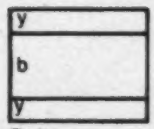
Alfa
Diver down; keep clear



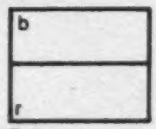
Bravo
Dangerous cargo



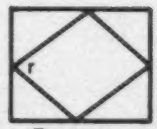
Charlie
Yes



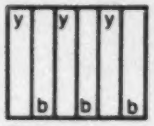
Delta
Keep clear



Echo
Altering course to starboard

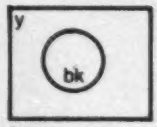


Foxtrot
Disabled

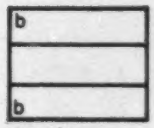


Golf
Want a pilot

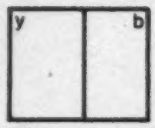
Hotel
Pilot on board



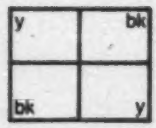
India
Altering course to port



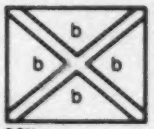
Juliett
On fire; keep clear



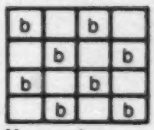
Kilo
Desire to communicate



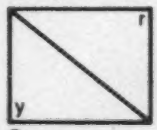
Lima
Stop instantly



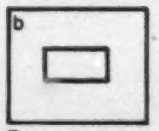
Mike
I am stopped



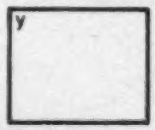
November
No



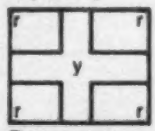
Oscar
Man overboard



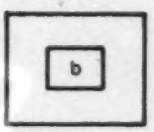
Papa
About to sail



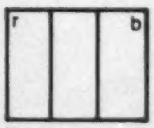
Quebec
Request health clearance



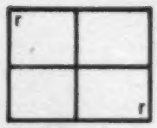
Romeo
(No message)



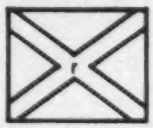
Sierra
Engines going stern



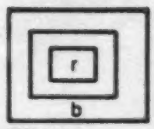
Tango
Keep clear of me



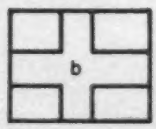
Uniform
Standing into danger



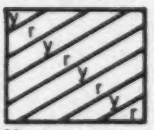
Victor
Require assistance



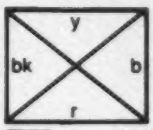
Whiskey
Require medical help



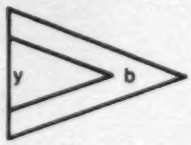
Xray
Do not carry out your plan



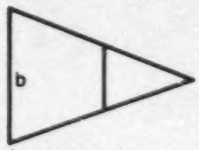
Yankee
Am dragging anchor



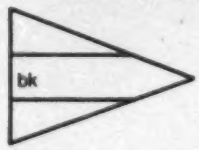
Zulu
Require a tug



1st repeater

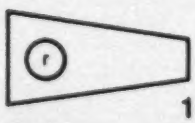


2nd repeater



3rd repeater

NUMERICAL PENNANTS



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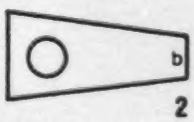

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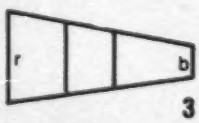

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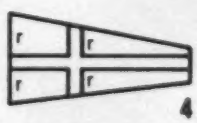

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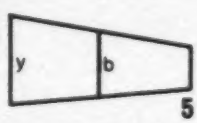

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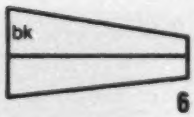

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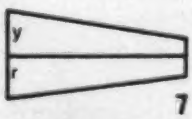

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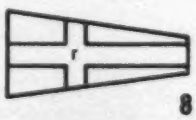

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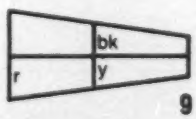

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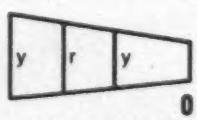

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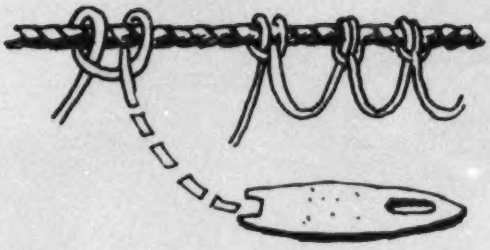
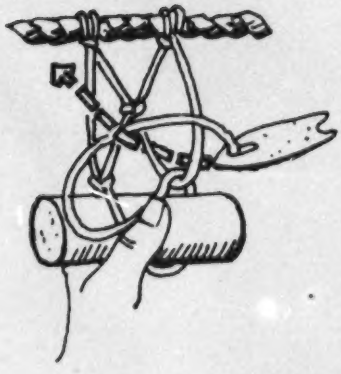
Net Making Knots

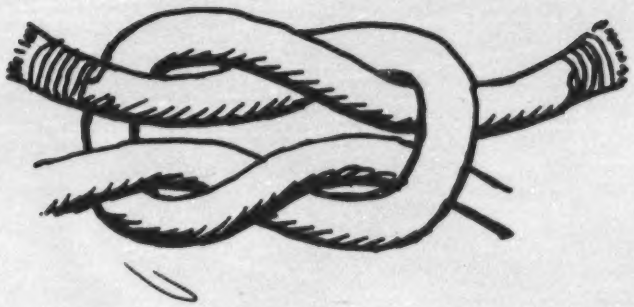


Clove hitch is used to attach twine to headline

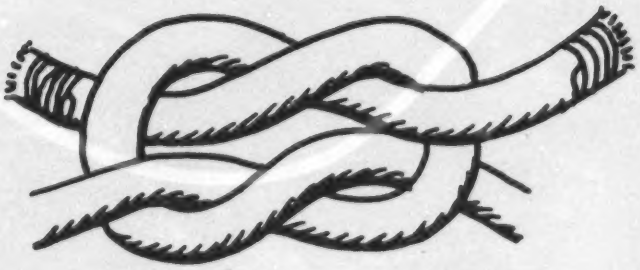


Fisherman's netting knot (the way of tying a sheet bend for netting)

Knot Tying

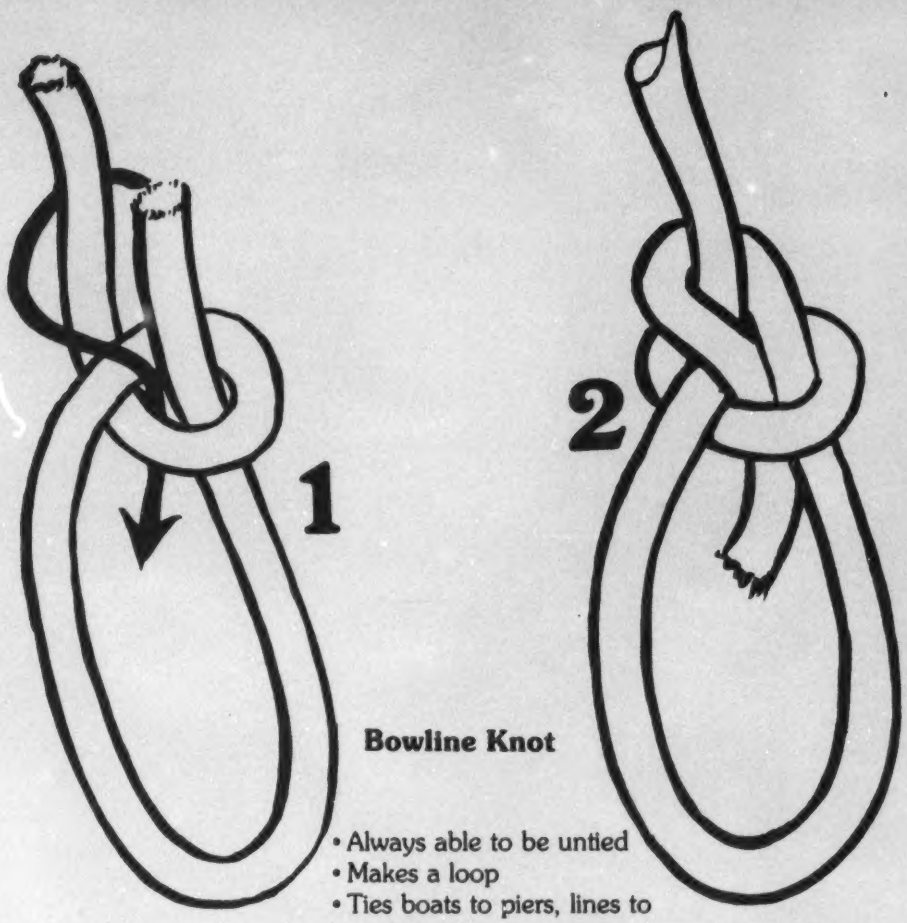


The **square knot,** or reef knot, is used in reefing (temporarily reducing the area of a sail), in tying up bundles of all kinds and for many other purposes. It is insecure if the two cords are of different sizes or materials.



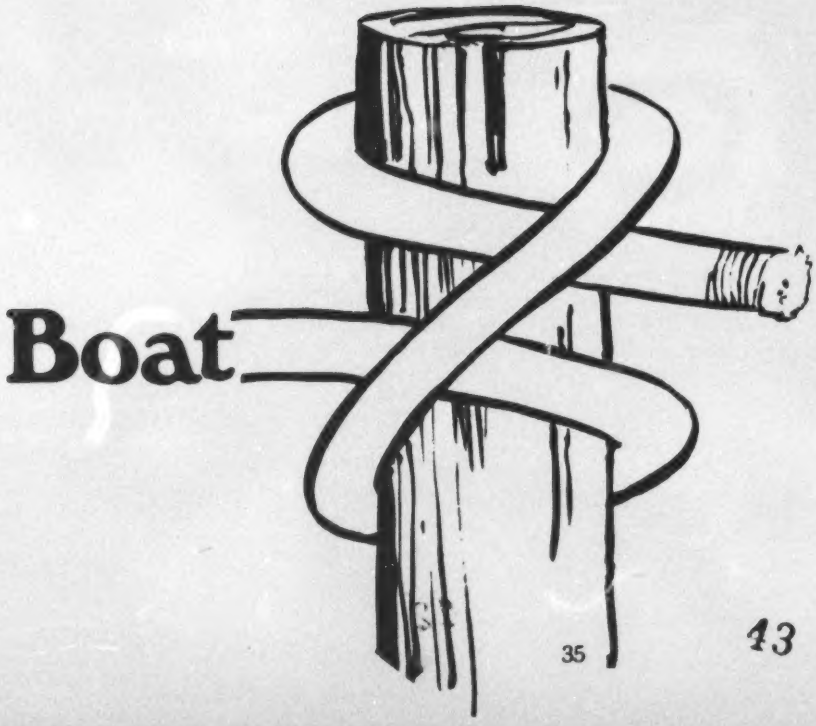
The **Granny knot,** or lubber's knot, is sometimes tied by mistake instead of a square knot. It is unsafe, however, and should always be avoided.

12



Bowline Knot

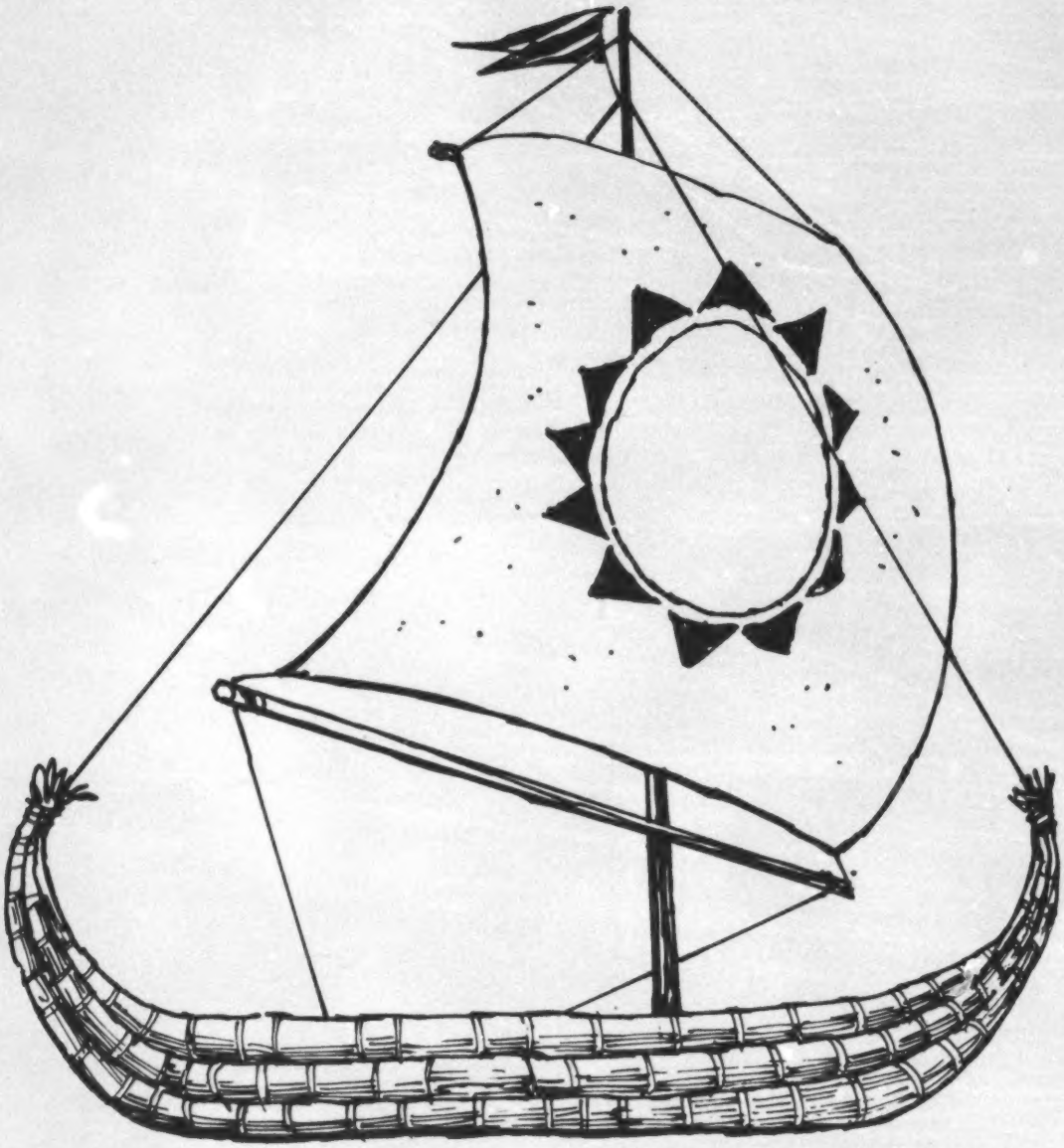
- Always able to be untied
- Makes a loop
- Ties boats to piers, lines to anchors, has many uses



Clove Hitch

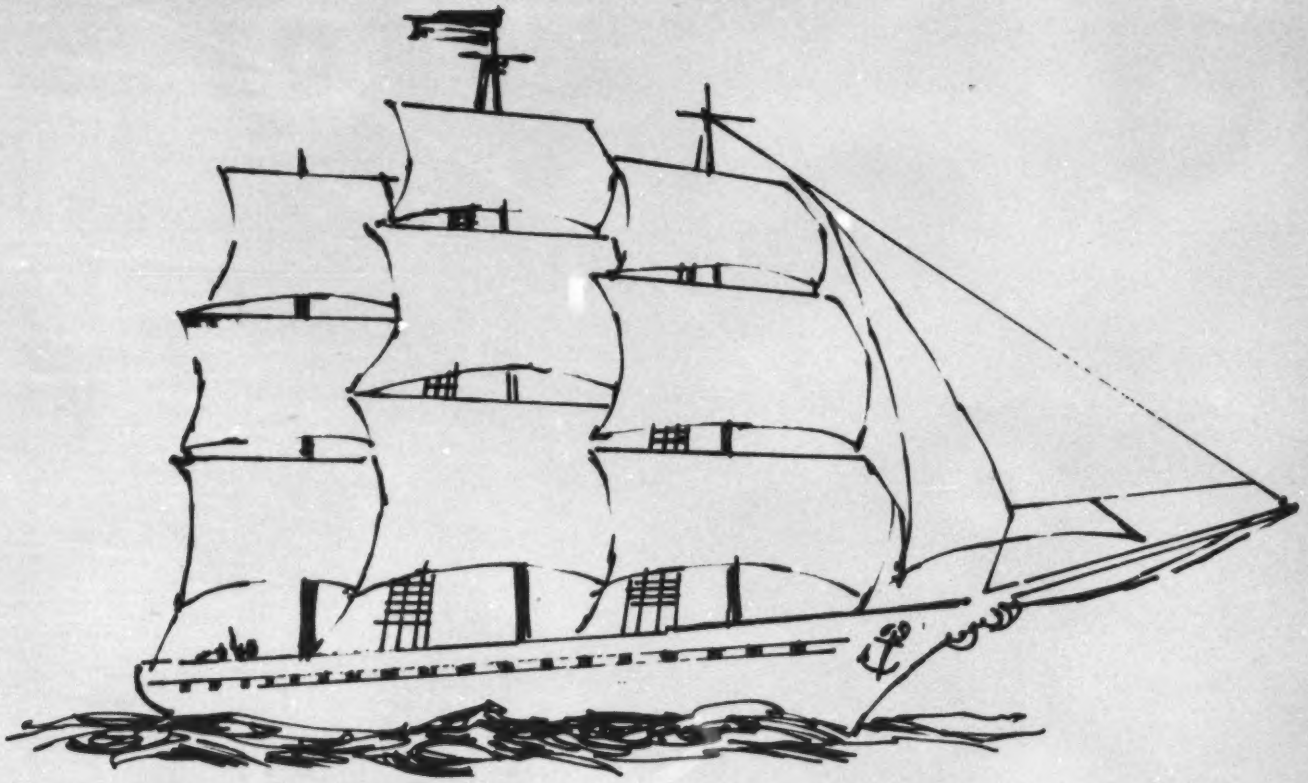
Used to tie boats to poles

43

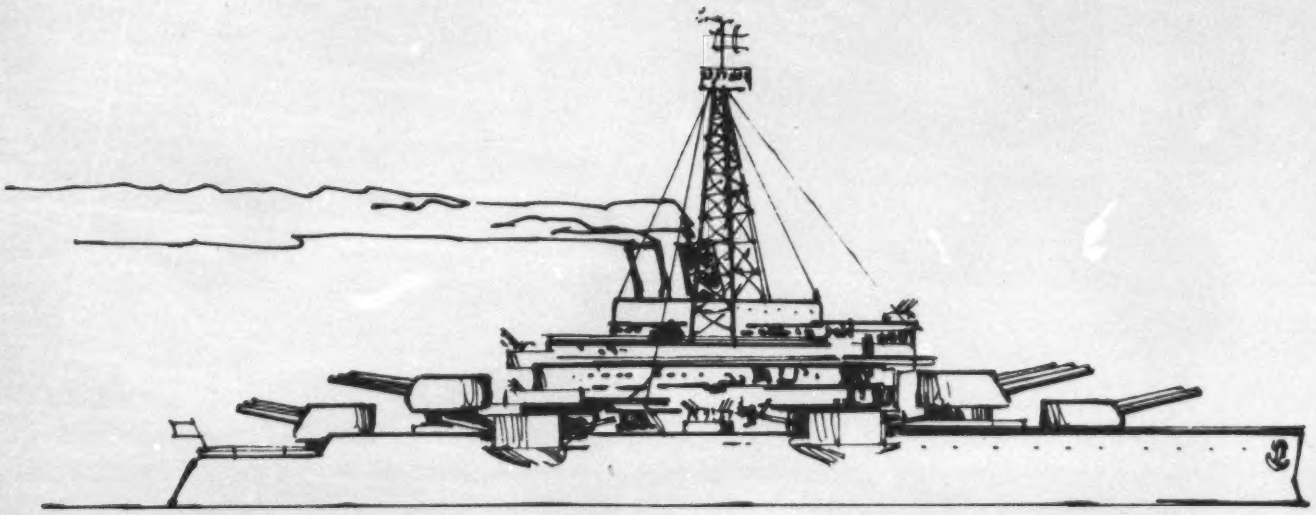


Papyrus Boat

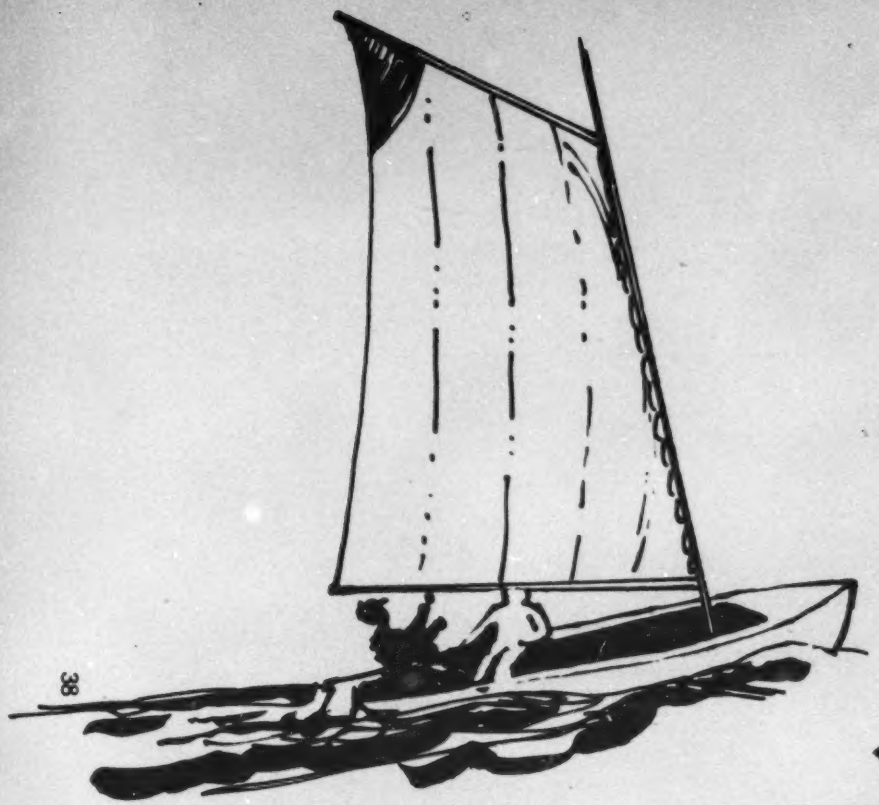
14



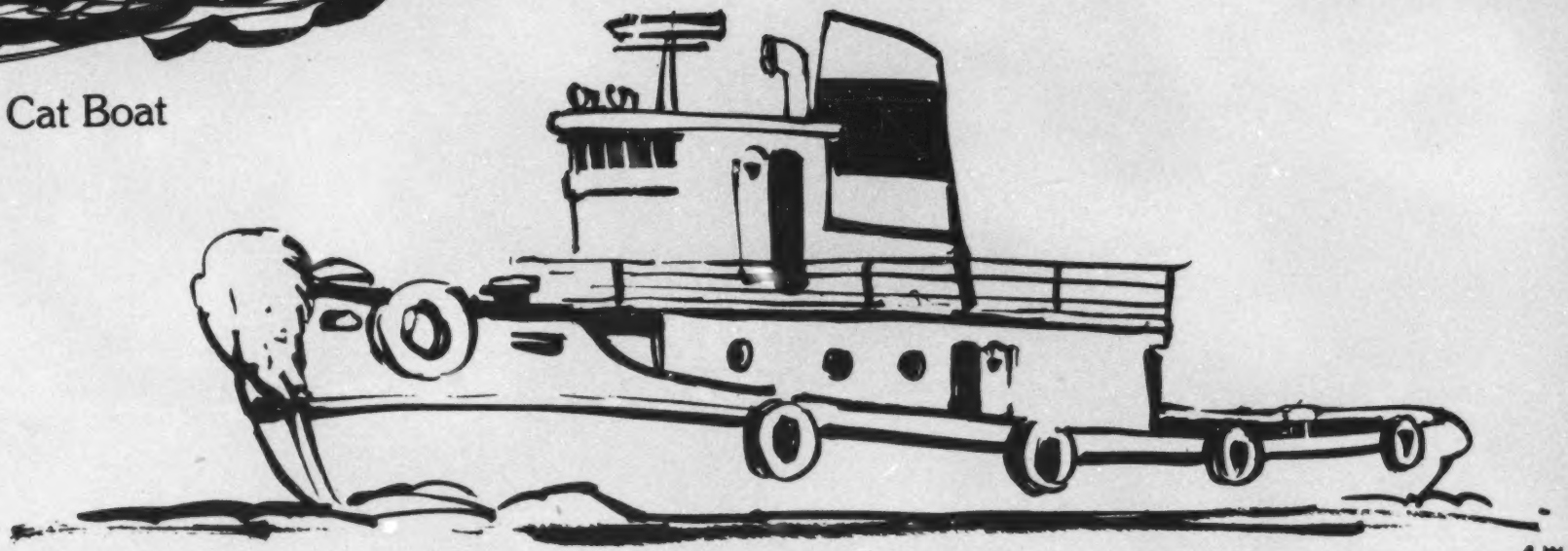
Clipper Ship



Battleship

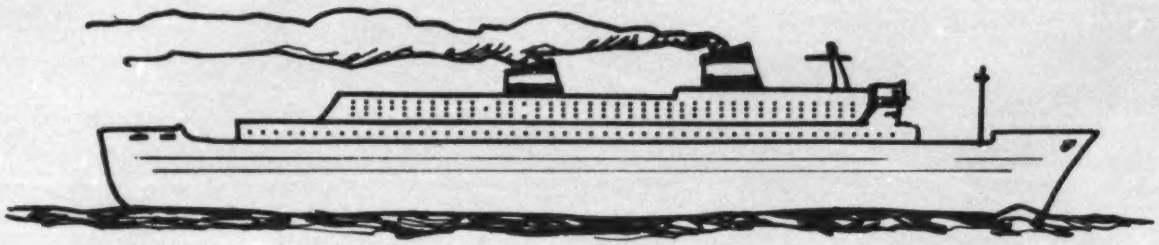


Cat Boat

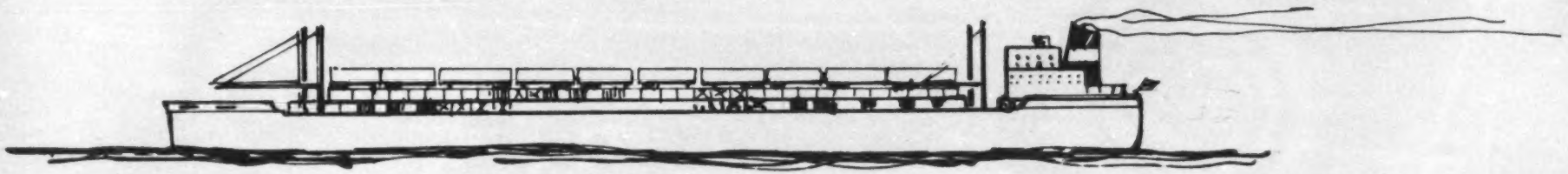


Tug Boat

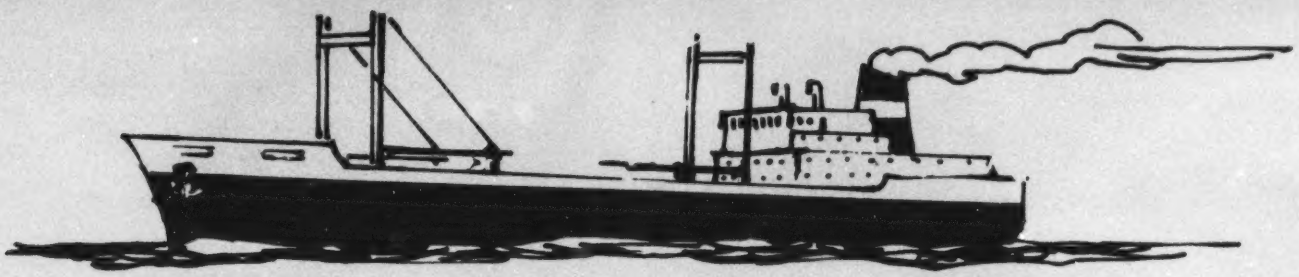
Oil Tanker



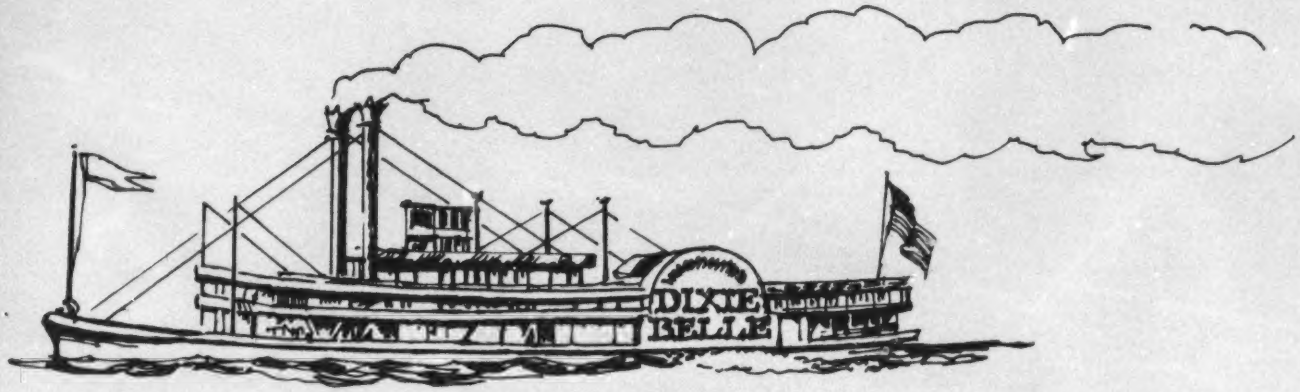
Cruise Liner



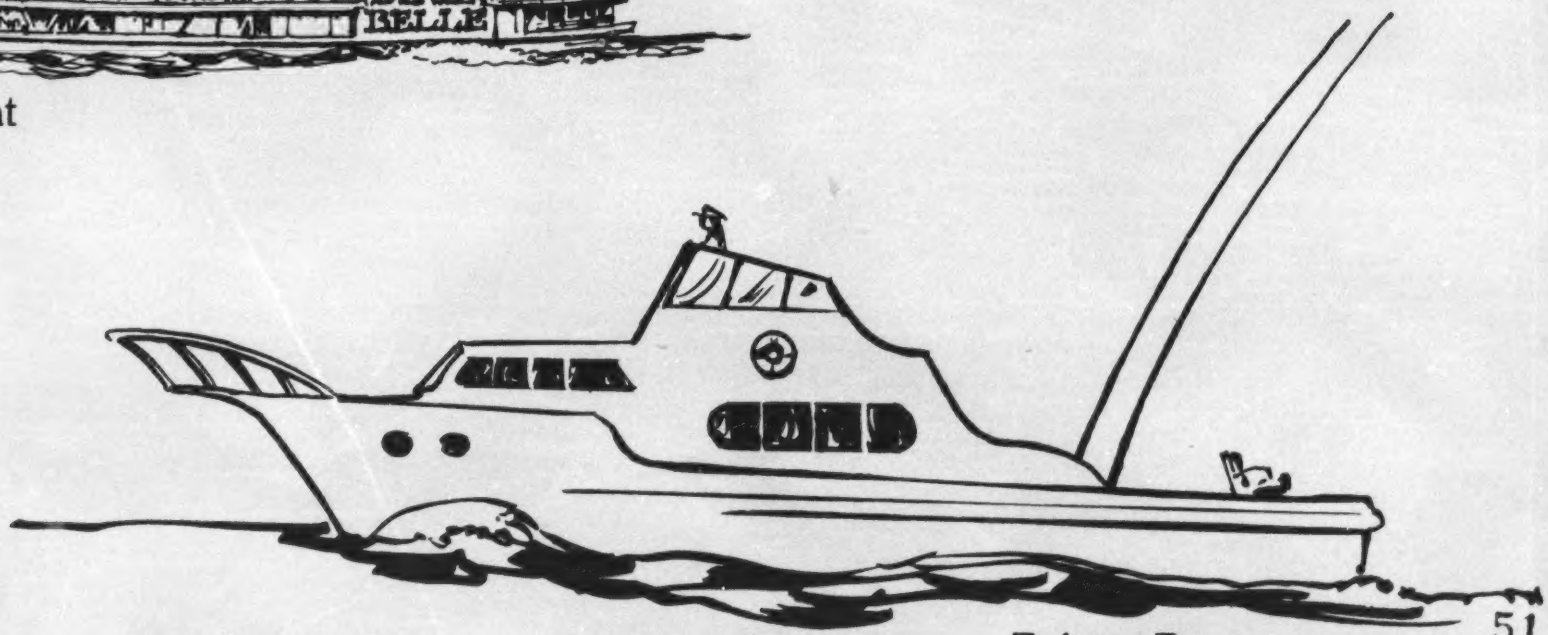
Sea Train



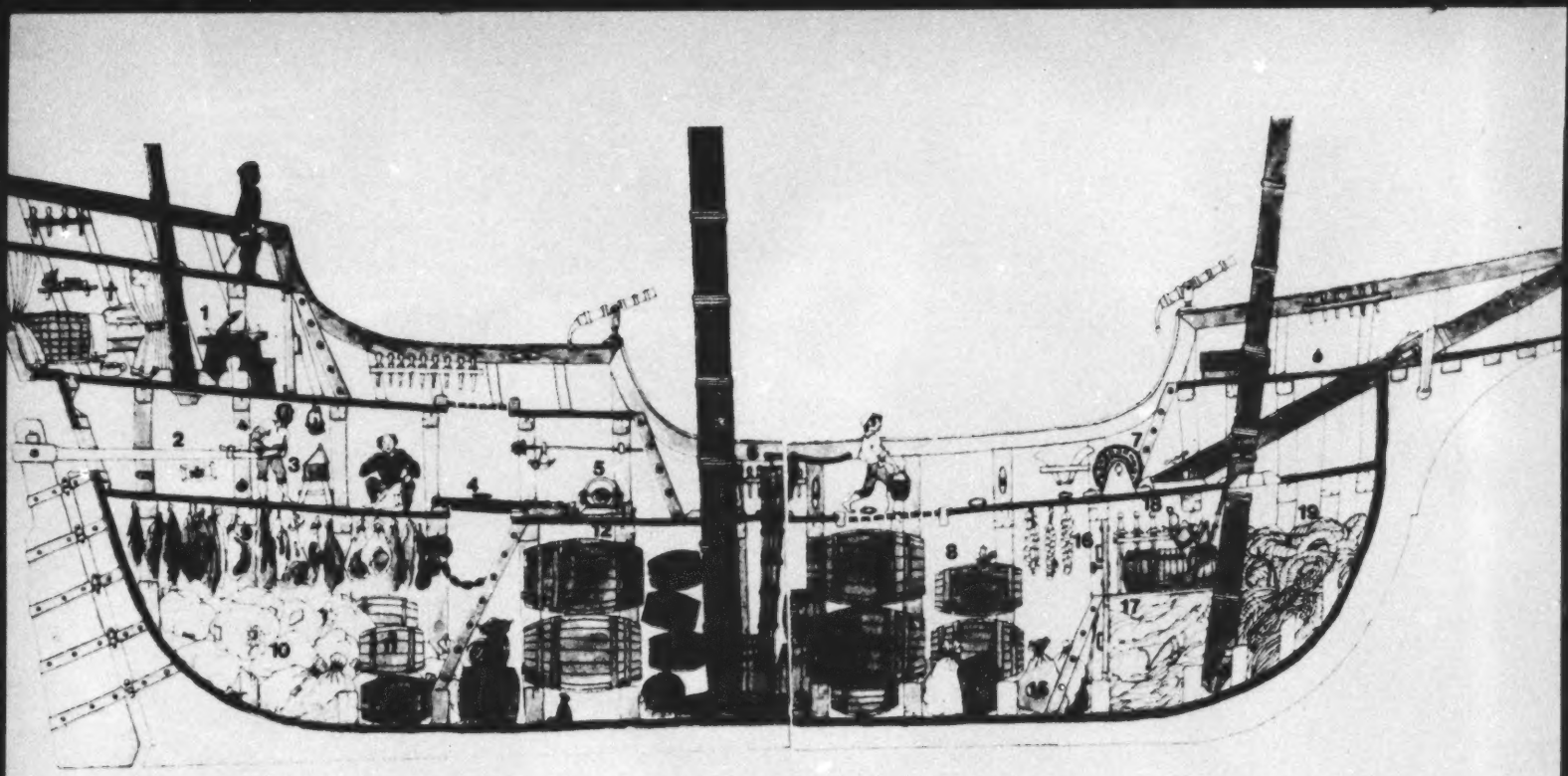
Passenger Liner



River Boat



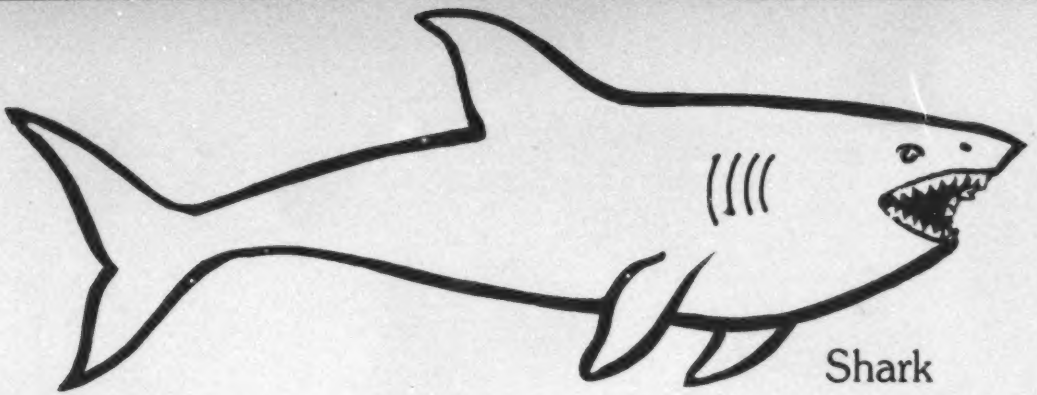
Fishing Boat



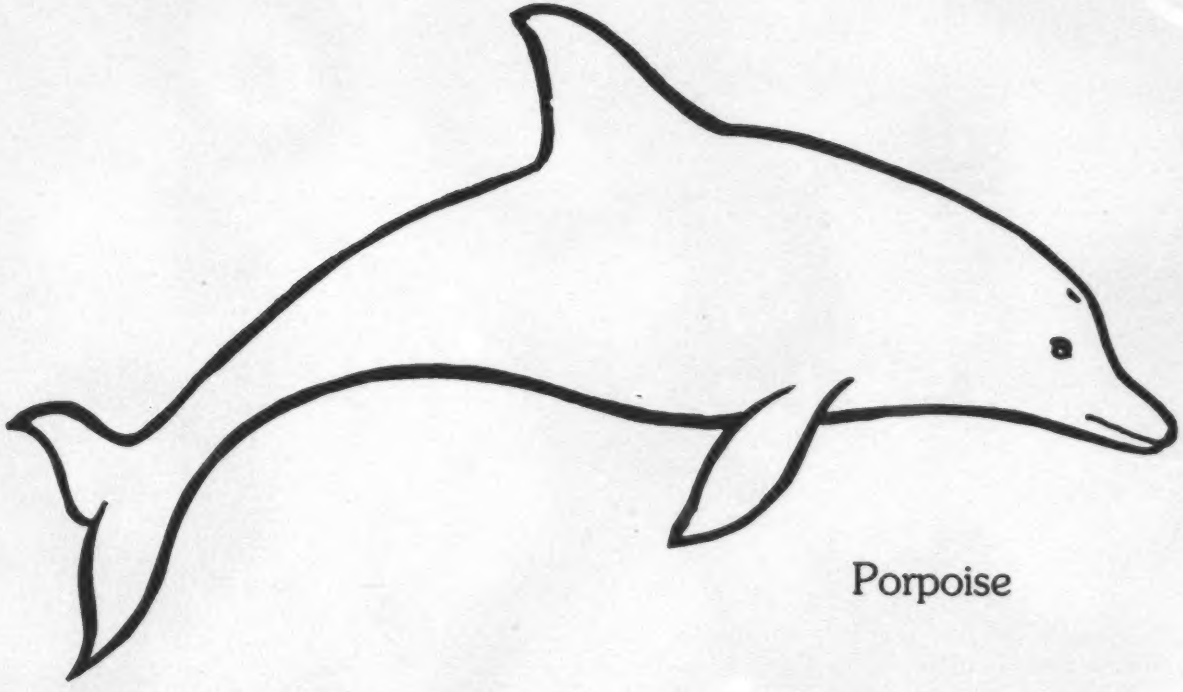
Ship's Cross-Section

1. Columbus' cabin
2. helm
3. compass
4. hatch to get down to hold
5. cannon
6. pump to draw water from the hold
7. winch for handling the sails and anchor
8. hold
9. salted meat
10. biscuits and hardtack
11. sardines and anchovies in saltwater
12. water
13. wine
14. oil
15. flour and wheat
16. garlic and onions
17. sails
18. arms and gunpowder
19. ropes and hawsers

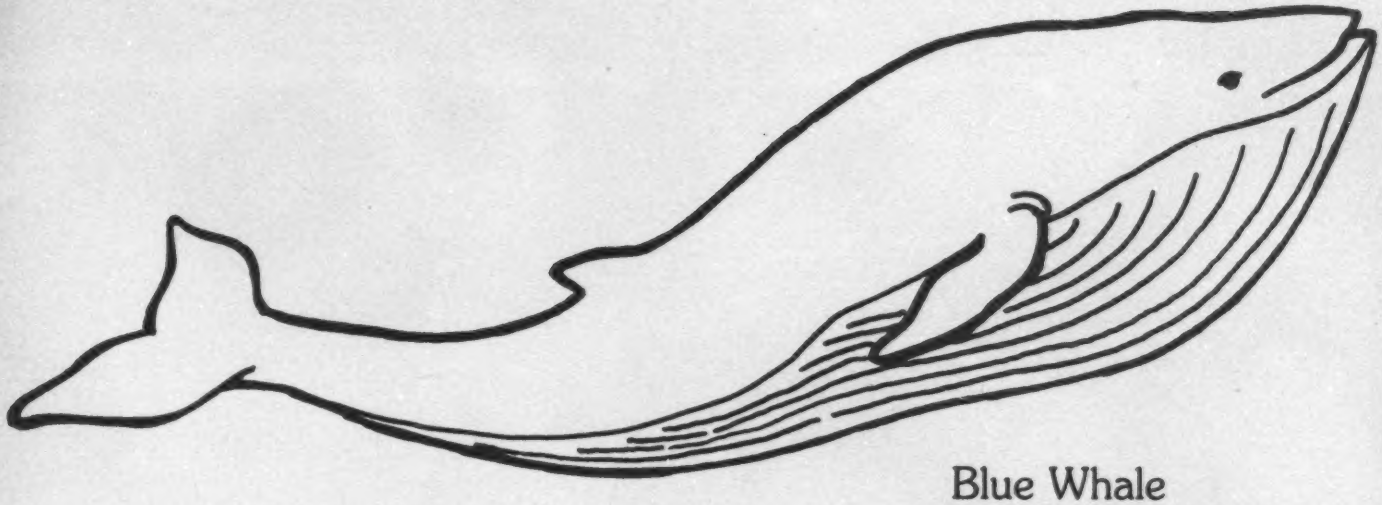
Christopher Columbus, by Piero Ventura
© 1978, Random House, New York



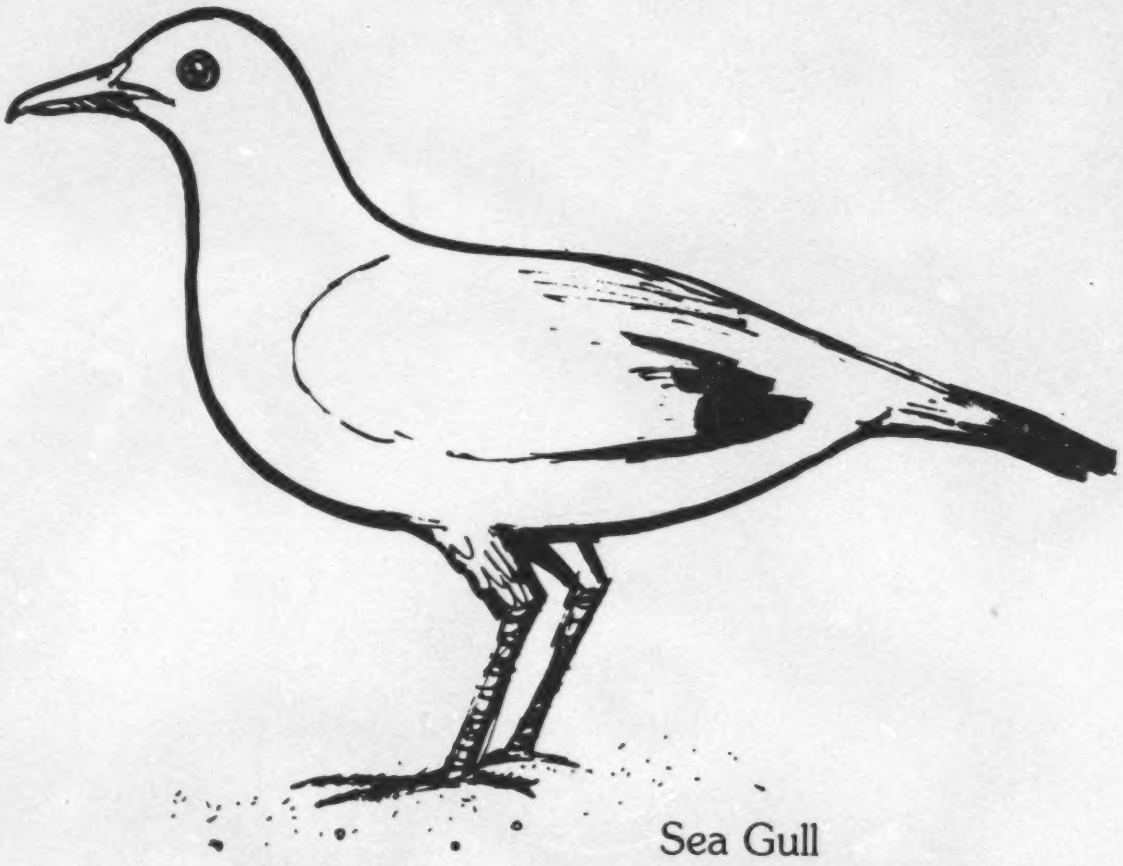
Shark



Porpoise

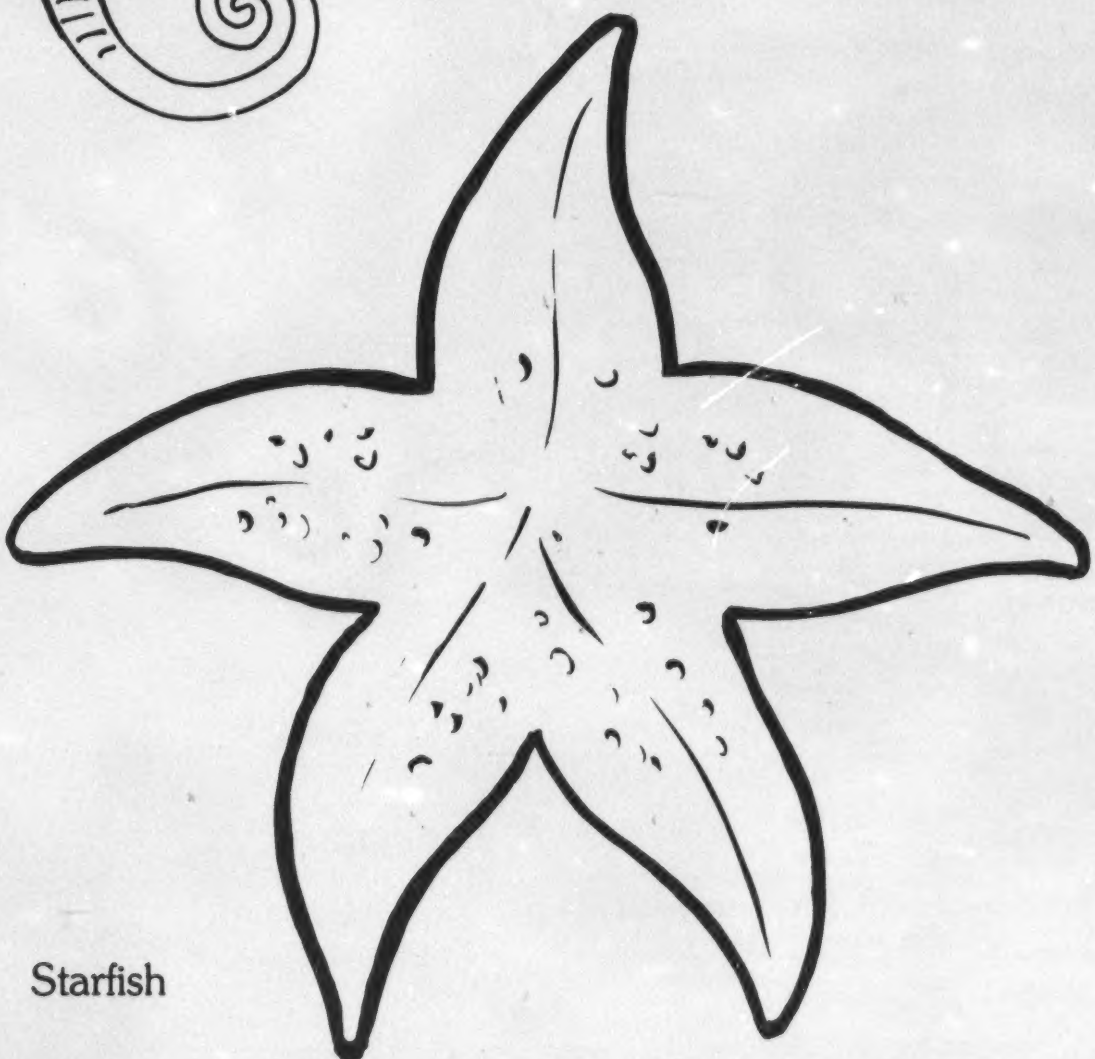


Blue Whale



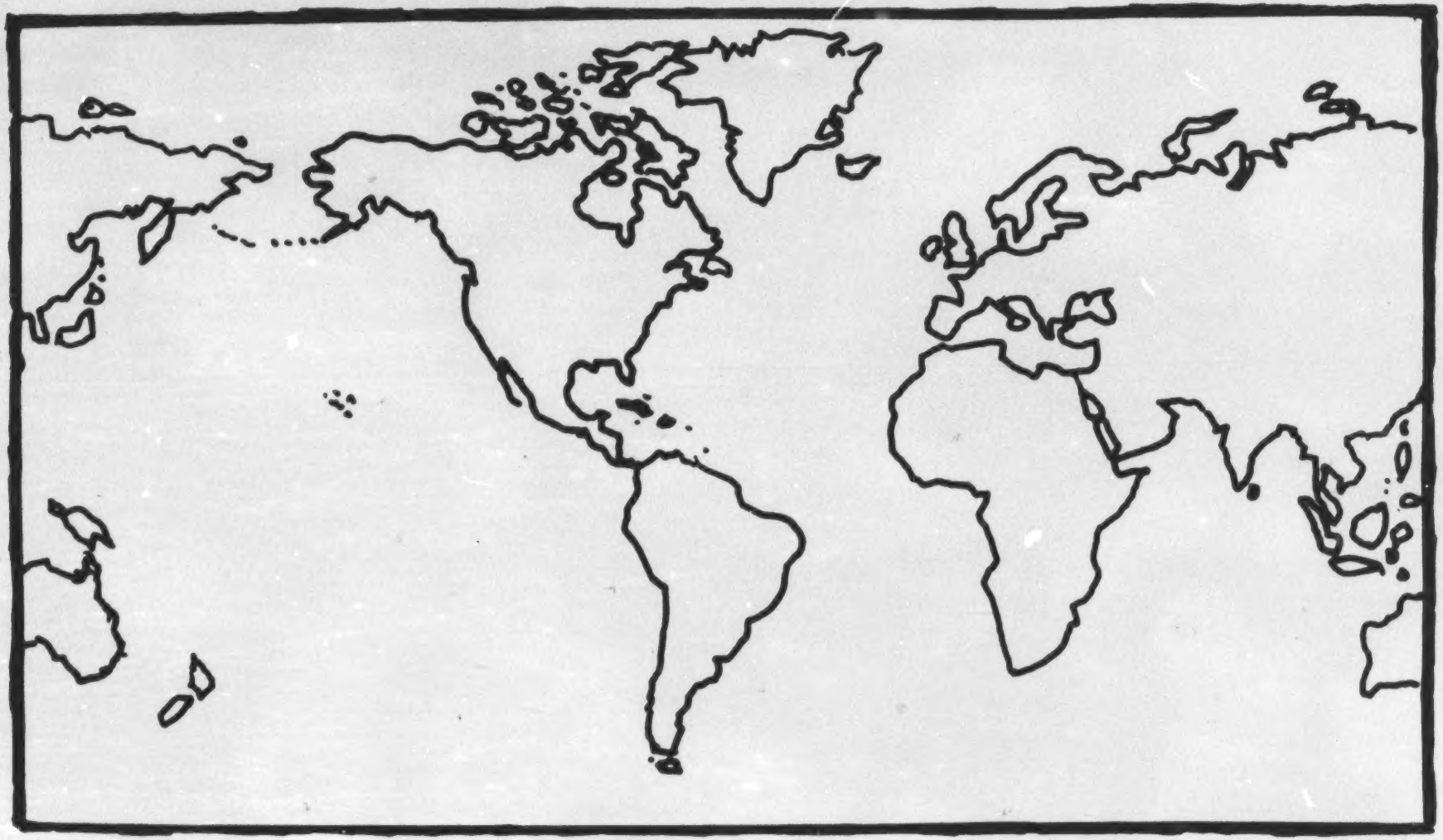
Sea Gull

Seahorse



Starfish

55



World Map

Free Materials

Brochures, Printed Materials

Boating Safety Information: Call toll free, 1-800-325-7376 (Missouri residents, call 1-800-392-7780)

Caribbean Tourism Association, 20 E. 46th Street, New York, N.Y. 10017

Brochure: "The Caribbean: A World of Its Own," which includes a map and colored photographs.

Cruise Lines International Association, 17 Battery Place, New York, N.Y. 10004

Map: Routes of trans-Atlantic passenger ships

Brochure: "Passenger Ships on the Atlantic Ocean"

Pamphlet: "Teaching Suggestions for Presenting a Unit on Steamship Travel"

East Carolina University, Marine Advisory Service, P. O. Box 699, Manteo, N.C. 27954

Brochure: No. POSGAP 9, January 1976, on net mending and patching, written by P. D. Lorimer, fully illustrated to show netmaking skills and the tools used.

Florida Department of Natural Resources, Larson Building, Tallahassee, FL 32304

Brochure: "The Story of Sea Turtles"

Insurance Company of North America, 1600 Arch Street, Philadelphia, PA 19101

Bulletin: No. HH-3776 "International Flag Alphabet Charts," includes symbols used in alphabet, meanings for individual flags, storm warning flags and other navigation aids and symbols.

Marine Advisory Service, University of Delaware, Newark, DL 19711

Book: "Seascapes: Glimpses of Our Water World," a 40-page book written by Jan Hardin containing newspaper reprints of articles on ocean life, including jellyfish, diving mammals, gulls and beach erosion.

National Geographic Society, P. O. Box 2330, Washington, D.C. 20013

Catalogue: Educational aids catalogue listing films, filmstrips and educational kits available through the Society.

National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Rockville, MD 20852

Maps: Hurricane tracking charts, available in quantities

National Wildlife Federation, 1412 16th Street, N.W., Washington, D.C. 20036

Pamphlet: "Wildlife of Lakes, Streams and Marshes"

Catalogue: Publications on conservation education

Sea Grant College Program, University of Hawaii, 2540 Maile Way, Spalding Hall 252B, Honolulu, Hawaii 96822

Workbook: "Makahiki kai," a 31-page brochure with student exercises such as word searches, how to make an algae press and fish printing. No. UNIHI-SEAGRANT-MR-77-01.

Sea Grant College Program, Marine Information Service, Texas A&M University, College Station, TX 77843

Bibliography: **Sea Sources,** a bibliography of literature and information books written for elementary ages; includes a section of free materials as well as a listing of periodicals for teachers of marine education. No. TAMU-SG-79-402.

Brochure: **Hurricanes on the Texas Coast,** describes Texas' most notable hurricanes for a 15-year period. Probability of hurricane occurrence, guidelines for individual responsibilities and checklists for action before/during/after a hurricane are included. No. TAMU-SG-75-504.

Brochure: **Trying to "Marinate Your Curriculum?"** includes an order form for all marine education materials currently available. No. TAMU-SG-79-406.

Magazine: **The University & The Sea,** published six times a year with articles on various Texas A&M University Sea Grant projects.

Texas Parks and Wildlife, 4200 Smith School Road, Austin, TX 78744

Instruction pamphlets: "How to Water Ski," "How to Tie Nautical Knots," "Canoeing Basics," "Bird Nests,"

"Drownproofing," "Hypothermia and Cold Water Survival," "PFD Types"

Pictures: Wildlife, 8×10, in color, with good descriptions

Price list of selected bulletins

U.S. Army Corps of Engineers, P. O. Box 80, Vicksburg, MS 39180

Booklet: "Mississippi River Navigation," illustrated

U.S. Department of the Interior, Geological Survey, 1100 Commerce Street, Room 1-C, Dallas, TX 75242

Pamphlets: "Marine Geology: Research Beneath the Sea," "Our Changing Continent"

U.S. Environmental Protection Agency, Youth, A 107, Washington, D.C. 20460

Pamphlets: "Our Endangered World," "ABC's of Human Ecology," "Needed: Clean Water," "Fun with the Environment"

Supplies

Paper

Newsprint: Newspaper offices often will donate the roll ends of newsprint

Cut paper: Print shops generally have scrap boxes which yield papers in many colors, usually in small pieces

Heavy paper: Business form companies often give away roll ends of heavy paper, such as tagboard or backing material

Transparency film

Used x-ray film generally is discarded by a hospital's radiology department and most hospitals will be happy to give it to schools. It has a slightly bluish cast which enhances its appeal for students doing sea art for overhead projectors.

Cardboard cartons

Local appliance stores: freezer or refrigerator cartons make small arks or ships

Mail order stores: a second source for freezer or refrigerator cartons; also, water heater cartons work well for sailing ships or long boats

Funeral homes: coffin cartons are a good size for combination sailing ships-reading corners

Lumber and sawdust

Most lumber yards have a scrap bin which they are willing for teachers to salvage. This generally yields enough lumber for an average class project. Sawdust is available from the same source; it is best to take a large grocery bag or small carton to carry the sawdust.

Low Cost Materials

Subscriptions

National Geographic WORLD, P. O. Box 2330, Washington, D.C. 20013

A monthly magazine that is the children's equivalent of **National Geographic** with excellent color photography and interesting articles. Subscription rate: $5.00, one year; $15.00, three years

Texas Parks & Wildlife, 4200 Smith School Road, Austin, TX 78744

A monthly magazine published by the Texas Parks & Wildlife department. Each issue includes a "Young Naturalist" feature which is designed for young readers.
Subscription rate: $5.00, one year; $9.00, two years

Scholastic Book Services, 50 West 44th Street, New York, N.Y. 10036

A variety of reading clubs is available through Scholastic and sea literature is frequently included in their regular selections for less than $1.00 per book. A catalogue is available from the address given. A minimum number of books is required for each order, but discounts are usually 25 percent. (NOTE: Both of the Millicent Selsam books listed in the bibliography have been available through the Seesaw and Lucky reading clubs.)

Other Materials

Marine Organism Card Game, Sea Grant College Program, Texas A&M University, College Station, TX 77843

A set of 48 marine organism cards is instructional as well as entertaining. The set can be used for two games, "Who's for Dinner" and "Who Eats Whom." Printed on heavy card stock, comes complete with a separate instruction sheet. It is an entertaining way to learn how the food chain operates and is suitable for ages 10 and up.
Cost: 50¢ per set

"Sea Chanties" and "The Noisy Sea" Cassette Tape, Sea Grant College Program, Texas A&M University, College Station, TX 77843

One cassette tape with representative sea chanties on one side and recordings of sea animals such as snapping shrimp, dolphins and various fish on the other.
Cost: $2.00

Activity and game books available from grocery, discount and variety stores.

These generally can be found wherever coloring books are sold and are useful in making the fun folders described. Grosset and Dunlap and Whitman Publishing are two publishers of this type of material.

Marine Animal Charts, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Full-color charts, each 30 × 48 inches. Order as follows:

Marine Fishes of the North Pacific, 003-020-00051-7, $2.30.

Marine Fishes of the Gulf and South Atlantic, 003-020-00065-7, $2.30.

Mollusks and Crustaceans of the Coastal U.S., 003-020-00087-8, $3.20.

Marine Mammals of the Western Hemisphere, 003-020-00106-8, $3.00.

Cold Water Survival Poster, Hunter Safety News, P. O. Box C-19000, Seattle, WA 98109

This poster gives techniques for staying afloat when in water unexpectedly. It destroys some old myths about flotation and gives advice on retaining body heat. Cost: $1.00.

Bibliography

Aaron, Chester. **Spill.** Atheneum, New York, 1977.*

Adkins, Jan. **The Craft of Sail.** Walker and Co., New York, 1973.*

Asimov, Isaac. **ABC's of the Ocean.** Walker, New York, 1970.

Two items for each letter represent this aquatic alphabet. Pronounciation guides are included for words such as Ichthyologist (ik-thee-OL-o-jist). Accurate, carefully done to invite further investigation, both pictures and text will interest older students, but even young children will appreciate the way Asimov teaches without talking down to his audience.

Babbitt, Natalie. **The Eyes of the Amaryllis.** Farrar, Straus & Giroux, New York, 1977.*

Bagnall, Norma. **Sea Sources.** Texas A&M University Sea Grant College Program, College Station, TX, 1979.

A bibliography of children's literature and information books of the sea. A list of sources of free materials for marine education teachers and a list of periodicals for marine education teachers.

Condit, Martha Olson, illustrated by Beatrice Darwin. **Something to Make: Something to Think About.** Scholastic, New York, 1975. Available in hard cover from Four Winds Press.

An information and reference book for teachers and students. The waterscope (pages 7-11) is an easy tool to make to watch life underwater. Classroom use of this tool is limited unless students are taken on a field trip to the beach, but it is worthwhile if the students make such a trip with their families. Other science experiments in the book can be adapted to the classroom.

Goudey, Alice E., illustrated by Adrienne Adams. **Houses From the Sea.** Charles Scribner and Sons, New York, 1959.

A combination of literature and information book, this text gives good descriptions and lovely drawings of common shells. It would be a good addition to a browsing table. Ages five and up.

Hardin, Jan. **Seascapes: Glimpses of our Water World.** Marine Advisory Service, University of Delaware, Newark, DL, 1978.

A reprint of newspaper articles of information about varying aspects of the beach for ages 10 and up. It includes bioluminescence, beach erosion, barnacles and the tide, with each subject separated for easy reference.

Hoover, F. Louis. **Art Activities for the Very Young.** David Publications, Inc., Worcester, MA, 1961.

This text, written as a reference for teachers of three to six-year-olds, gives the philosophy of early childhood art, shows how materials are used and lists each activity separately so the techniques can be easily duplicated in the classroom. Weaving looms are illustrated and instructions for making them are included (pages 31-33). Many of the activities can be adapted for marine eduation and also for older students.

Kohn, Bernice, illustrated by Arabelle Wheatley. **The Beachcomber's Book,** Penguin (a Puffin Book), New York, 1976. Also available in hard cover from Viking Press.

This combined literature-information book helps students discover the joys and treasures found on beaches and then experiment with things to make from those finds. The book is written for a variety of ages (all elementary grades), and explicit directions are included with detailed drawings. Common shells and sea weeds also are illustrated.

List, Ilka Katherine. **Questions and Answers About Seashore Life.** Woodcuts by the author, drawings by Arabelle Wheatley. Four Winds Press, New York, 1970.

This is an information book about animals and plants that live in the oceans. Meant to be appreciated by readers ages eight and up, it contains well-written information to appeal to any age and is accompanied by clear illustrations in brown and white that are both artistic and scientific.

Morris, Percy A. **A Field Guide to Shells of the Atlantic and Gulf Coasts and the West Indies,** illustrated with photographs. Third Edition edited by William J. Clench. Houghton Mifflin Co., Boston, 1973.

Teachers familiar with the Peterson field guide series will recognize the thoroughness of information contained in this guide. It is written for adults, and much of the information is too complex

*Description included in Book Synopses section.

for most children, yet it is an excellent guide and worth having available for the rare student who wants to investigate a subject thoroughly and scientifically. The photographs are predominantly black and white, with only a few in color. Like all Peterson guides, the name of each item is opposite its photograph and a page reference is included for complete information. Teachers need to familiarize themselves with this book before taking it into the classroom.

Munson, Howard R. **Science with Simple Things.** Fearon Publishers, Belmont, CA, 1972.

This is a reference book for teachers but it includes instructions that will be easily read and understood by students 11 and over. The science experiments included require only simple objects, most of which are found in the home or are easily obtained for classroom use.

O'Dell, Scott. **Island of the Blue Dolphins.** Dell, New York, 1970.*

Rice, Tom. **What Is A Shell?** Erco, Inc., Tacoma, WA, 1973.

This small book introduces the more common mollusks. Written for an adult audience, it is a good guide to classroom identification of shells for ages 10 and over because of the clear, full-color photographs and concise text.

Selsam, Millicent E. **Animals of the Sea.** Illustrated by John Hamberger. Four Winds Press, New York, 1975.

This information book, written for preschoolers through grade three, gives facts about the food chain as it operates in the sea as well as descriptions of several of the animals about which children are most interested. Hamberger's full-color illustrations are carefully integrated into the text. Indexed, with average sizes of animals listed.

Selsam, Millicent E. **Birth of an Island.** Illustrated by Winifred Lubell. Harper and Row, New York, 1959.

Written for ages 10 and up, this information book tells how an island is formed through volcanic eruption and how it comes to have plant and animal life. Selsam writes factually but with stylistic features that stimulate the imaginations of her readers.

Spier, Peter. **Noah's Ark.** Doubleday and Co., Garden City, NY, 1977.*

Tallarico, Tony. **The Shark Activity and Game Book.** Grosset and Dunlap, New York, 1975.

This is a paperback book similar in appearance to a coloring book and is written for ages nine and up. It includes pencil games such as crossword puzzles, mazes and shape identifications. It is used in the Fun Folder activity.

Taylor, Theodore. **The Cay.** Doubleday and Co., Garden City, NY, 1977.*

Ventura, Piero. **Christopher Columbus.** Random House, New York, 1977.*

Yashima, Taro. **Seashore Story.** Viking Press, New York, 1967.*

Zim, Herbert S. and Lester Ingle. **Seashores: A Guide to Animals and Plants Along the Beaches.** Illustrated by Dorothea and Sy Barlow. Golden Press, New York, 1955.

This guide, written for adults, is easily understood by upper elementary students. It contains full-color illustrations and clear, concise text about shells, plants, birds and other features of beaches and oceans. Scientific as well as common names are given. Indexed.

*Description included in Book Synopses section.